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ABSTRACT

Five papers presented at the 9th symposium held during the 42nd annual meeting of the Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science are: (1) "Do We Need a Sociology of Arid Regions"?; (2) "Deficit Creating Influences for Role Performance and Status Acquisition in Sparsely Populated Regions of the United States"; (3) "Ecology, Economy and Society in an Agricultural Region of the Northern Great Plains"; (4) "The Problem of Drought Perception"; and (5) "Technological Conservatism in Cattle Ranching as an Adaptive Process". The papers, centering on an ecological viewpoint, aim to suggest possibilities of basic research on sociological adaptations in moisture-deficient regions. Discussions cover modern agrarian and town populations in the Great Plains and neighboring semiarid regions. (NQ)

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Social Research in North American Moisture-Deficient Regions

Edited by:
John W. Bennett

Contribution No. 9 of
The Committee on Desert and Arid Zones Research
Southwestern and Rocky Mountain Division, A.A.A.S.
New Mexico State University

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Social Research in North American Moisture-Deficient Regions

A Symposium held during the forty-second annual meeting of the Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science.

May 4, 1966
Las Cruces, New Mexico

arranged by
John W. Bennett
for the
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PREVIOUS SYMPOSIA OF THE SERIES

1. CLIMATE AND MAN IN THE SOUTHWEST — University of Arizona, Tucson, Arizona — Terah L. Smiley — 1957.

2. BIOECOLOGY OF THE ARID AND SEMIARID LANDS OF THE SOUTHWEST — New Mexico Highlands University, Las THE SOUTHWEST — New Mexico Highlands University, Las Vegas, New Mexico — Lora M. Shields and J. Linton Gardner — 1958.

3. AGRICULTURAL PROBLEMS IN ARID AND SEMIARID ENVIRONMENTS — University of Wyoming, Laramie Wyoming — Alan A. Beetle — 1959.

4. WATER YIELD IN RELATION TO ENVIRONMENT IN THE SOUTHWESTERN UNITED STATES — Sul Ross College, Alpine Texas — Barton H. Warnock and J. Linton Gardner — 1960.

5. ECOLOGY OF GROUNDWATER IN THE SOUTHWESTERN UNITED STATES — Arizona State University, Temple, Arizona — Joel E. Fletcher — 1961.

6. WATER IMPROVEMENT — A.A.A.S., Denver Colorado — J. A. Schufle and Joel E. Fletcher — 1961.

7. INDIAN AND SPANISH AMERICAN ADJUSTMENTS TO ARID AND SEMIARID ENVIRONMENTS — Texas Technological College, Lubbock, Texas — Clark S. Knowlton — 1964.

8. NATIVE PLANTS AND ANIMALS AS RESOURCES IN ARID LAND OF THE SOUTHWESTERN UNITED STATES — Arizona State College, Flagstaff, Arizona — Gordon L. Bender —1965.

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STATEMENT OF PURPOSE OF THE COMMITTEE ON DESERT AND ARID ZONES RESEARCH

Objectives of the Committee are to encourage the study of phenomena affecting and affected by human occupation of arid and semiarid regions, primarily within the areas represented by the Southwestern and Rocky Mountain Division of A.A.A.S. This is interpreted to include educational and research activities, fundamental and applied, that may further understanding and efficient use of our arid lands.

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Introduction

JOHN W. BENNETT

The central viewpoint of the papers of this symposium, the ninth in the series of annual symposia sponsored by the Committee on Desert and Arid Zones Research of the Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, is ecological. They aim at suggesting to social scientists possibilities of basic research on sociological adaptations in moisture-deficient regions, and they deal with modern agrarian and town populations in the Great Plains and neighboring semiarid regions.

The authors represent several related fields: Cleland and Kraenzel are sociologists; Saarinen is a geographer; Bennett and Maloney are anthropologists. In different ways, they all seek to suggest some of the opportunities provided by an ecological approach to problems of social and economic development and change. This approach is new in social science, in which the ecological outlook has had a mixed and uneven history, having been most frequently confined to a simple correlation between habitat and culture or to specialized distributions of social phenomena. In the papers in this volume, the authors are committed to the idea that the most significant approach to sociological research on the development of Great Plains society involves consideration of the total environment.

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Do we need a Sociology of Arid Regions?

Courtney B. Cleland
(University of Arizona)

One purpose of this paper is to discuss a long-term strategy for research. The author's position is that there is not now a general sociology of arid regions and probably never will be, unless certain other events take place. The particular need is for much more *systematic* study of human societies in scattered arid areas of the world such as the American Southwest, the Australian outback, the Kalahari desert in South Africa, and similar locales.

Two leading questions for such research are: (1) Do the people in each area display a history of, or a push toward, *regional* group life? (2) If so, what role does the aridity play in it? That is to say, how are their regional cultures influenced or altered by past, present, or potential need to make social adaptations to the physical fact of their aridity?

When we have accumulated more adequate data along these lines, we may or may not be motivated to move to a higher level of abstraction in order to formulate a true cross-cultural sociology of arid regions. At least a possible consequence is that the task will be feasible but not "needed" in a scholarly sense. If it promises to result in so slight a scientific statement that it can be merely a footnote in regional sociology, it would be hardly motivating to researchers or attractive to dispensers of research funds! The other extreme is that an explicit sociology of arid regions may turn out in fact to be enormously useful, widening our knowledge of man's behavior and leading to many practical applications barely discernible now. At the present stage of knowledge, we cannot predict that either of these outcomes or some other outcome eventually will emerge.

It is necessary to examine the foregoing propositions in more detail. How do sociologists define regions? What would the prospective sociology of arid regions look like? How may the larger task be broken down into more specialized types of inquiry such as a sociology of the American West or Southwest? And what are the alternatives to a sociology of arid regions?

The Concept of Region

The problem of defining regions is an endless one. As a concept, the region is only a way of reacting to certain patterned phenomena. We can have as many regions and kinds of regions as there are frames

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of reference for perceiving them. Despite this peculiarity or probably because of it, the region as a concept for research has value for many disciplines—humanities and social sciences as well as physical and biological sciences.

There is no particular reason to believe, however, that an "arid region" which makes sense for botany or zoology is necessarily going to be a useful unit for the social sciences. Similarly, the regions delineated by political scientists may seem overly formal and far from satisfactory to some sociolgists. Much depends upon the nature of the research problem, its point in historical time, and the possibilities and limitations of the methodologies used.

We follow Odum and Moore in considering more particularly what constitutes the sociologists' region (26). At its core it is a geographic area, with flexibility of limits ("margins" rather than precise boundaries). As a social unit it displays a degree of homogenity in selected, usually measurable characteristics, largely determined by the dominant structural and functional aspects of the region. This homogenity is relative and changeable, based on the largest number of factors compatible with a practicable, workable social unit. Further, contrary to older ideas of "sectionalism," the region is *interdependent* with other regions as constituent units in the total national society. This last trait is not considered in conflict with the notion that the region itself has an organic unity growing out of its own cultural evolution involving people, land, time, and special relationships (8).

Whatever the variation in concepts of regions, the sociological region displays a certain pattern or patterns which tend to differentiate its human *group life* from that of other regions. That this pattern of group life is significantly affected by dry climate would be a basic assumption of the sociology of arid regions. In theory the aridity should show up strongly in the "dominant structural or functional aspects" and in the constellation of social characteristics which document the region's relative homogenity. A simpler way of stating the problem is to ask what correlations exist between the region's aridity and the behavior of its population and what factors account for this correlation.

Only when a series of these relationships had been discovered for a number of regional populations would we be in a favorable position for constructing a sociology of arid regions, valid for all the inhabited continents. In other words, establishing only the sociology of the American Southwest or West, as estimable a task as that is, contributes to—but does not constitute—the sociology of arid regions. It gives us one important segment, which in turn must be compared with counterpart data from the arid regions of South America, Africa, Australia, interior Asia, and elsewhere.

Comparative Sociology

Through the painstaking study of regional differences and similarities, hopefully we could arrive at a body of systematic generalizations relating recurrent characteristics of human group life to

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aridity wherever it is found on a regional scale. To assert such principles of behavior for residents of, for example, deserts as diverse as the Gobi and the Mohave may seem to some readers as fruitless as it is difficult, but its possibility is a premise guiding all efforts in comparative sociology. As one example, oasis-centered social organization is a cross-cultural concept already fairly well developed. Kraenzel went all the way from Montana to Iran to perceive this oasis pattern in all its significant overtones (19).

No doubt there must be more knowledge of many particular arid regions (preferably classified according to a common analytic scheme) before we shall feel that an attempt at general regional synthesis is likely to show much profit. Therefore, for the time being, the larger task of a sociology of arid regions is probably best set aside while we in this part of the world concentrate on more concrete regional sociologies, such as that of the American Southwest or West and the Mexican Northwest.

For this task, happily, we can borrow from geographers, anthropologists, and others, at the same time building on past research of sociologists. As examples one thinks of Wilson's studies on urbanization in the Southwest, approached from the viewpoint of geography (37, 38); the anthropologist Goldschmidt's studies of "urbanized" rural life in California, particularly the classic comparison of the Arvin and Dinuba communities (11, 12, 30); the 12-year series of community studies in Arizona and Sonora by McCleneghan and others including sociologists, sponsored by the University of Arizona's Division of Economic and Business Research (24), and the recent book, *Farmers, Workers and Machines*, the collaborative effort of Padfield and Martin, an anthropologist and an agricultural economist (27).

Sociological Contributions

From the sociologists themselves we have basic studies such as "Demographic Characteristics of the United States-Mexican Border" by Beegle, Goldsmith, and Loomis (1), and from Taylor and others, the description of U.S. rural group life by major type-farming regions including the Western specialty crop and the range-livestock areas (31). More specialized monographs include Nelson's study of the Mormon village, which shows how a religiously inspired plan of settlement tended to be adaptive for desert conditions (23).

The development and use of social areas analysis in Los Angeles illustrates only one contribution by the urban sociologists (29). In fact, we are probably in a better position to describe the group behavior of oasis populations than that of the dry-land people. Other published and unpublished studies including those by state agricultural experiment stations delve into such subjects as population trends, the Spanish-speaking people, the Indians, the bracero movement, education, land use, water law, irrigation districts, political attitudes, religion, and other aspects of the culture including folklore, attitudes and values of the people (7).[1]

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The book entitled *Variations in Value Orientations*, by Kluckhohn and Strodtbeck, turns to advantage the variability of culture in a common physical setting by comparing in one New Mexico area five communities, which in their respective population compositions are dominantly Zuni, Navaho, Spanish-American, Mormon, and Texan (16). Values centering about water supply and water allocation are included in this study.

While many of these researches stand as excellent individual studies, there is a scarcity of efforts to integrate them into a meaningful general work—nothing which does for the arid West what Kraenzel's *The Great Plains in Transition* did for the sociology of that semi-arid region (18). Works such as Mezerik's *The Revolt of the South and the West* (21) and journalistic and semi-popular treatises such as Morgan's *Westward Tilt* (22) or Fergusson's *Our Southwest* (9) are suggestive and appreciated, but sometimes dated and not definitive.

There are simply very few substantative sociological studies of any type on the American West or Southwest which are truly regional in orientation. The agricultural experiment stations in 1965 formed an advisory committee on social research in the Western region, with Dr. Walter Slocum, a Washington State University sociologist, as chairman. This group aims to encourage cooperative research among states into such regional topics as the sociological implications of poverty and of the development of natural resources and recreation. The Mexican-American Project headquartered at the University of California in Los Angeles is both regional and interdisciplinary. But there appear to be few sociological studies that investigate regional phenomena as they find expression in business and governmental circles—ABC's "Radio West" network, for example, or the regional headquarters locations of various federal agencies.

The West as Desert

As examples of attempts to achieve a higher level of generalization about the arid West, we may mention the work of the historian Webb and the sociologists Zimmerman and duWors. In 1931 Webb published what has become a classic work in American studies, *The Great Plains*, in which he documented the adaptations made by the settlers who emerged from the humid Eastern woodlands and undertook to live in semi-arid country (34). The Great Plains is a region of relatively simple structure compared to the more heterogeneous West. It was another quarter-century before Webb published his new thesis that "the overriding influence, the force that shapes more things in the West than all else, is the Desert. That is its true unifying force." And further: "One reason we do not understand the West is that we will not face a fact. We do not want the desert to be there" (33, 36).

Webb identified as Desert States eight states (New Mexico, Arizona, Nevada, Utah, Wyoming, Colorado, Idaho, and Montana). The six states to their immediate east and the three to the west he called Desert Rim States because they form the right and left flank of the desert, and each has arid or semi-arid areas of considerable extent (35.)

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The furor Webb's statements created in U.S. Senators, state governors, newspaper editors, businessmen, and others was itself an interesting sociological phenomenon in the region. If anything, it seemed to support Webb's claim that Westerners refuse to accept the idea that their region is a desert. Some of Webb's views need more rigorous testing, to be sure, but his basic approach remains as an illuminating central thesis for bringing order to massive regional data.

Zimmerman and duWors as part of a larger work entitled *Graphic Regional Sociology* gave a sketchy but suggestive description of the arid West stressing needed community and housing adaptations (41). They too cope with its varied parts but assert: "All of it will eventually have to tie the humid oases and irrigated spots with the drylands into a liveable regional socio-economy. In all of it men must come to the waterways and oases and build their communities. They can go out annually or seasonally to work the drier regions, but fundamentally their life will be centered at the waterhole" (41).

These sociologists also utilize concepts such as the "oasis farm-industrial city" and the "water-use regional personality" which may have utility for the more abstract sociology of arid regions. Their ideas also need more empirical testing. From casual observation it would seem that the "water-use personality," for example, is more characteristic today of rural and relatively impoverished residents than it is of the Westerners in the oases. Before the village of Oracle, Arizona acquired a water company and sewage system a few years ago, the residents had to truck in water or rely on inferior wells. However, according to an informant, "the people now use water like the people of any other town, and only the oldtimers tend to conserve water in remembrance of the way things used to be"(28).

Regional Delineation

The West or Southwest cannot be assessed in noble isolation. It is necessary to study their linkage with other regions, and for this purpose identification and descriptions of the other regions are needed. Over the years many sociologists have tried their hands at the delineation of American regions. We may examine briefly two of the resultant studies.

Odum, who was the leading regional sociologist a generation ago, allocated 48 states to six regions on the basis of clusterings of statistical indices (25). Because he relied on the U.S. Census materials of his day, he felt he must conform to state lines; hence 17 Western states were subdivided into three regions: the Far West (California, Oregon, Washington, Nevada), the Southwest (Arizona, New Mexico, Texas, Oklahoma), and a vast 9-state Northwest (Kansas, Nebraska, South Dakota, North Dakota, Montana, Wyoming, Colorado, Idaho, and Utah).

With the development in 1950 of a new Census unit, the "state economic area" (composed of counties with similar social and economic characteristics), the sociologists Bogue and Beale produced a new classification (2). With the use of statistical tests of homogeneity,

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relatively similar state economic areas were collected into 121 economic subregions which could cross state boundaries. Roughly homogeneous subregions in turn were combined into 13 regions and 3 huge "economic provinces," as the authors termed them. The Western province was subdivided into three regions named, respectively, the Rocky Mountain and Intermountain Region, the Pacific Northwest Region, and the Pacific Southwest Region.

The economic subregions are not necessarily entities which communicate much to the non-specialist (for example, the sparsely populated "Western Desert, Semi-Desert, and Mountain Subregion" composed of all of Nevada, the Utah basin and plateau area, northern Arizona, the Eastern Oregon plateau and Blue Mountain area, and the eastern and northern California mountain and valley area—"a monstrosity," according to an anonymous geographer). Other subregions, however, such as the Southern Arizona, the Southern California, and the California Central Valley subregions, are more compact, more meaningful to the public, and do have the great advantage of lending themselves to analyses based on accessible Census data.[2]

Perhaps an obvious project in ecological correlation, although nothing has been reported in the literature as yet, is to discover what connections exist between the subregional social and economic structures that can be defined through Census data and the five North American deserts (and subdivisions) which are described in natural-science terms by Jaeger (15). In that way one might detect clues to linking the variations in aridity with the use heterogeneity of human adaptations.

Limitations of the Approach

The apparent heterogeneity certainly will be one of the more complex problems to be explained by a sociology of arid regions. In fact, it has led some sociologists to warn of the limitations of a regional approach. Regions result not only from physical facts like aridity, they point out, but also from cultural facts of customs, ethnic groups, and variable social institutions. As Wirth put it, "the most dissimilar cultural phenomena have been found to exist in the most similar environments, and vice versa" (39). Modern technology and mobility of people compound this situation. At any rate, Wirth feels that "we must always reckon with the mobility of men and ideas to undo regions" (39).

Without abandoning the regional approach, two responses to this kind of warning can be suggested. One reply is that there is no intention for researchers to stay at the single-factor level of explanation represented by sheer aridity. We can continue to *add* more factors until we are able to show in our arid-region "model" the range of possible behavior patterns for arid regional societies which are in various stages of social and economic development.

The other comment is that, as more and more technologically complex arid regions evolve and are studied, aridity may so diminish

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as an explanatory variable that aridity *per se* may well be de-emphasized, but not necessarily the region itself as the unit of study. For example, what started to be a sociology of arid regions could give way to a sociology of Yonlands (or sparsely populated regions), if we found a certain type of population distribution pattern to be more basic than climate as such. Such regions might include non-deserts such as heavily forested land, swamp country, or frozen tundra. In truth, if present metropolitanizing trends continue unabated, the sociology of Yonlands may become the 21st-century successor to the field known today as rural sociology. This is one possible alternative to a sociology of arid regions.

Whether or not a comprehensive arid-region sociology is ever synthesized, clearly there will continue to be concrete researches into specified behaviors such as, to name a few, man's shared perceptions of drouth hazards, his attitudes toward big-dam construction as a response to water problems, or his public and private support of the kind of agriculture, industry, architecture, community development, or recreation that the experts claim is most adaptive for arid-zone living.

Some of the skepticism about the possibilities of going beyond specific pieces of research to a true regional sociology probably stems from a failure to understand that there are various levels of attack in regional analysis (32). To some observers, an archeology of arid regions probably would seem more promising than a sociology of arid regions because the former deals with much earlier cultures where man "adjusted" to nature rather than "conquered" it (40). Along this line, a present-day arid region marked by a crude stage of technology and by low-energy use would seem comparatively simple to study in terms of group life as linked to aridity. Among Tucson residents, on the other hand, we may have difficulty in finding genuine adaptations to aridity. Yet we have only to go a short distance to see Papago Indians in simple but solid dwelling units which allegedly resist the heat better, or we can go to a coastal-desert town in Sonora where the inhabitants know that the source of their expensive and inferior water is a well 20 miles away, with this hard fact directly reflected in their social attitudes and habits, the community infrastructure, and their homes.

Man in the Southwest

Still, we also must be able to handle analysis of forces and processes operating in the technologically advanced and more complex arid regions. How does one explain the group behavior of contemporary American Southwesterners? Can it be partly in terms of the aridity and its consequences, is it something else entirely, or is it the combination of aridity and perhaps several major independent variables?

If we consider the distinctiveness of the Southwest in sociological terms, certainly we shall be aware that it is more arid and

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presumably more vulnerable to water problems than other U.S. regions (although in 1965 we might have been confused by our difficulty in getting a glass of water in New York City!). We might be even more impressed with the ethnic composition of population in the Southwest—that it has the lion's share of American Indians, that it is the region which has the greatest number of people of Mexican and Spanish background, that it has many Negroes and people descended from Oriental strains, and that for over a century it has been the target for large in-migration by "Anglo" Americans from the Midwest and other regions (3).

If we wanted to stay at the level of single-factor analysis (although there is no need to), we might find, not aridity, but a "mobile ethnic mix" to be the dynamic force which sets off the Southwest, producing an extremely varied region in which almost nobody seems to live in his own hometown and a majority of at least the middle-class citizens has grown to adulthood in some other region (incidentally, a circumstance which could help to account for the relative lack of water-use consciousness among many Southwest residents). Not the least of the consequences is a region of political and economic contrasts, with a heritage of social problems so intertwined and deep-rooted that some observers have referred to it or portions of it as "perhaps America's best kept secret"(4). Aridity and its effects constitute one aspect of this social-problem complex (for example, as a factor affecting migration) but even the estimate of its relative influence is a subject awaiting research.

Los Angeles and Phoenix share aridity, but Los Angeles as a social entity has more in common with that humid giant, Chicago, than it has with Phoenix. If the Phoenix of 1966 is indeed "a little Los Angeles" as a *New York Times* critic charged (6), it it not because of their common aridity, but because the "urban garishness" the critic referred to is a world-wide phenomenon. Neon lights and go-go girls or their equivalent are found in Paris and Tokyo too! One of the New York critic's chief complaints about Phoenix was its plan for freeways into and across the city—hardly a problem unique to cities in arid regions. Nor is smog a monopoly of these cities.

In the sociology of arid regions, it is the comprehending of the combination of variable aridity with numerous sociocultural variables that engages our attention. In the end we may be able to "adapt" to the aridity easier than to stubborn human culture (14).

When people began moving into the Southwest desert in increasing numbers after 1940, it was hardly a mass demonstration of their willingness to accept new modes of living necessitated by the arid climate. There is little environmental adaptation in suburbs oriented exactly like New Jersey subdivisions, with homes that lack design for optimum coolness and that feature lush green lawns which faithfully replicate those of remembered Iowa homesteads. The apparently abundant water and electricity made major changes in living habits unnecessary. Deep wells and air conditioners enabled modestly affluent families to live comfortably almost anywhere they chose. In

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the home any "adaptation," if it can be called that, was often the negative one of a lesser quality of construction and materials than that required by Northern winters. In some cases attempts to make more sensible housing adaptations were actually forestalled by local laws and customs imported from humid areas."

Conclusion

Southwestern man meshes with the national economy of abundance and not with the regional economy of aridity. As Hastings and Turner put it: "He lives at the expense of an arid region and surrounded by it, but not with it. His technology enables him to escape its rigors without making concessions." (13) One notes that this pattern of living falls short of the interdependency characteristic of Odum's construct of region (26); it is more dependent than interdependent.

Here, paradoxically enough, may lie an important motivation for pursuing without delay a sociology of arid regions. Here in the American Southwest such study may show the adaptations we *should make* rather than those we *have made*. Every social and economic projection looking fifty to 100 years into the future has predicted the need for adjustment sooner or later to water shortage in this region. Eventually we shall be forced to do what we now do not know how to do or do not choose to do. And if we observe carefully the peoples and societies of less technologically developed arid regions, we probably shall not have to learn as many adaptations the hard way, through trial and error, but can build on knowledge from other, supposedly "less favored" arid regions.

At the same time, imperatives of professors' work being what they are, the practicable area of research for many of us will continue to be the Southwest itself. One's own region is "a familiar place, where we know, to some extent, the lay of the land, the traits of the people, and their resources, needs and problems" (26). On this view of the region, no doubt sociologists and others in this part of the world can readily agree and can join forces in improving our joint knowledge. When we get enough post-holes dug, we can proceed to build the fence which will enclose a better sociological comprehension of America's great arid regions and, hopefully, in time, all arid regions.

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Deficit Creating Influences for Role Performance and Status Acquisition in Sparsely Populated Regions of the United States

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INTRODUCTION

In addition to sparsity of population in the semi-arid Great Plains and arid West of the United States, there is continuing population loss in many of these areas. Population increase tends to occur only in strategic oases and Sutland parts of the several regions. Except in the case of strategic oases areas, there are no large cities; and communication and transportation services are limited. Oases employment and economic expansion opportunities are also limited. However, the alternate ways of the American humid area culture are being pushed upon the semi-arid and arid regions where pluralism cannot be supported, except at a high cost.

These above conditions create a unique phenomenon, that of social cost of space. In turn, this becomes a further limiting force on population and economic growth.[1] This cost of space represents a deficit condition in which effective role performance and status acquisition are difficult to invent, achieve and maintain, especially when faced with great change.

The object of this paper is to identify and conceptualize some of the ways in which role performance and status acquisition are limited by the social cost of space, and are interfered with by influences coming both from within and from outside the semi-arid and arid regions. These limitations and interferences create confusion and conflict in the absence of adapted devices that might help the residents to be more effectively organized. There would appear to be a negative effect on role performance and status acquisition arising from these deficiencies so that the socialization of people is often handicapped or inhibited.

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These interferences with socialization, especially in effective role and status definition, are further exaggerated by the minority aspects of behavior in the region.[2] The population itself is sparse and essentially without voice in matters of both local and national concern. Within this population are many sub-minorities—race, occupation, religion, nationality, social class and sub-regional organizational groups. As farms and ranches become larger and suppliers of services become fewer, population decreases and this deficit becomes a psychological barrier. Lack of growth, in a society which measures its stature chiefly by accretions in size, is truly a handicap. This, coupled with less work and business opportunity, does not make for constructive role performance and status acquisition in the regions. Motivation may, in fact, be based primarily on negative factors such as fear and insecurity or simply on lack of direction.

In addition to orienting the structural and processual aspects of role and status to the facts of sparsity,[3] the three other aspects that will be emphasized in this paper are:

(1) Internal aspects of role and status deficits in the sparsely populated regions;

(2) External aspects of role and status deficits in the sparsely populated regions;

(3) Exploratory hypotheses regarding role and status dynamics in sparsely populated regions.

Role and Status and Their Structural and Processual Aspects

Role and status are a part of the structural aspects of any social system. Every society has some kind of hierarchy—a class system.[4] There is a variation among societies only on a continuum indicating a range from those with fairly open and flexible classes, allowing relatively ready intake and departure, to those with a strictly closed caste-like hierarchy, permitting no intake. These class or caste levels represent a hierarchy of status levels. Individuals may aspire to these, or they may be excluded by ascribed rules and regulations. In a sparsely populated area, chiefly agricultural in nature, the class differentiations tend to be less.[5]

Within these status levels, or cutting across them, are the roles that people perform. These are of son, husband, father, grandfather, provider and so forth, as examples of male roles. For the female they may be daughter, wife, mother, grandmother, president of the Ladies Aid, housekeeper or homemaker. These are only a few of the roles that people may play at one time or another in their lives. They may cluster into a multiplicity of roles that must be played at one and the same time.

The more significant point, however, is that there are also processual or interactional aspects attached to these roles and statuses.[6] They permit and require interaction between people. Without the structural aspects of role and status there can be no interaction. The reverse is also true. A person can be a husband only toward a wife or a

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parent only toward a child; or a neighbor only toward a neighbor. In some societies these roles may be the same regardless of status levels; in others they may differ strikingly by status levels. Studies have shown that high and low social classes, for example, have differing customs, role prescriptions and mores as to courtship, love, sex relations, work habits, food habits and other behavioral patterns related to role performance.[7]

The point is that there are interactional or processual aspects attached to the structural aspects of role and status.

A clear definition of status and role in both structural and interactional aspects is always essential to understanding human behavior. When confronted with social change of the present magnitude there are many emerging problems that make for confusion. Where technological change and resultant loss of population have intensified the social cost of space, this confusion is especially acute. These will require an intensification of research efforts and the use of results in purposeful direction of social processes.

Internal Aspects of Role and Status Deficits in the Sparsely Populated Regions

It is impossible to catalogue the many deficits that prevail in the semiarid and arid regions regarding role and status. This is an especially pressing situation in the northern Plains states which are also the colonial area bearing a tribute-paying stance to the humid regions of the nation.[8] These latter areas are in a commanding position because they are highly urbanized and industrialized.

It is well known that the Great Plains, and much of the arid West, are also largely agricultural with a very minimum of industrial opportunities at present, and these chiefly of the raw-material extraction type. Both of these types of economic activity are highly mechanized and the operating and management units of both have become ever larger in size and capital requirements. The result of this has been a striking decrease in the number of farm and ranch units[9] and only a minimal growth in employment in the highly skilled industrial labor categories.

Since role and status goals, values and opportunities have been primarily attached to work, earning, property ownership and acquisition of income and property,[10] the fewer opportunities in the highly skilled laboring occupations and in farming and ranching have created sharp deficits in role and status opportunities. The social values of family-ranch and family-farm objectives, coupled with a high birth rate in the past, have not easily given way to these new trends. Hence the traditional role and status goals and objectives are unrealistic in the light of current size, capital investment requirements and mechnization. Many people have, in fact, not made this role and status goal transition. The situation is similar for hard-rock mining and for rail transportation. There is much confusion and conflict.

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There is also an exodus of population, including departure of youth who were, by tradition, intended to be the inheritors of the family-type occupations and estates and the associated values favored by older generations. These facts are demoralizing, not alone for farmers and ranchers and for laborers and businessmen but for schools, churches, communities and trade centers. This means loss of community and ever fewer opportunities for other kinds of social role experiences. All of this means a diminution of the capacity to become or remain social.

The Great Plains and much of the arid West are cityless. This is especially true of the four northern Great Plains states—the two Dakotas, Montana and Wyoming. For example, the Great Plains portion of these four states, constituting 242,437 square miles, has no cities of 100,000 or more population; yet an area of equivalent size in the Ohio Valley (involving the totality of six states) has 22 cities of such size. The Great Plains youth, when leaving the farm, must generally move out of the states involved, indicating critical deficits in role and status opportunities.[11] Even smaller cities are relatively few within this region. There were only 12 towns of 10,000 to 49,999 in this four state northern Plains region; for the equivalent size Ohio Valley area there were 291 towns of this size.[12]

The inference is not only that there are a decreasing number of work opportunities in the agriculture of the region, but work opportunities along the mainstreets of the towns and small cities of the region are limited and do not offer great promise for expansion. It seems that these limited opportunities result in a decrease in valid role models, and hence in role deprivation and status dislocation. Moreover, the limited opportunities result in additional tensions, even within families. Thus confusion in regard to role and status acquires an additional deficit quality.

The case of the Great Plains is somewhat different from that of the arid West. The arid Mountain and Inter-mountain West is so arid that people can live only in oases—man cannot survive in the arid stretches outside the irrigated portions. Some of these oases also contain relatively large towns, even cities of significant metropolitan influence.[13] For this reason, the arid West, for the present, has been growing agriculturally, industrially and in other ways. However, these oases are limited by the availability of water. In the Great Plains people live all over the land—on dry as well as irrigated land. This makes for greater physical as well as greater social separation of people. Community centers are, therefore, smaller, weaker and farther apart. Roles are rather highly individualized and status in often self-ascribed.[14]

It may be that role deprivation and status dislocation in the arid oases West have been less apparent, but as real as in the semi-arid Great Plains. It may even be true that the highly urbanized portion of the oases West, in relation to the more agricultural segments are a more crassly domineering and, therefore, deficit-creating influence

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in role and status matters than are the humid, urbanized metropolitan areas in their relation to the sparsely populated Great Plains.

The arid Southwest (7 states) is presently on a grand scale water hunt. This may well include the raping of the other four arid states to the north, and Western Canada.[15] The success of such a raid may postpone the plundering of the agricultural and rural segment of the oases for a time, but finally the latter, too, will be exploited.

It appears that, except for a temporary period, the less urbanized and industrialized oases—the sparser populated segments—will suffer from internal role and status deficits as much as, and in a similar manner to the semi-arid region, in this instance the Great Plains. For the Great Plains states, lack of role opportunity and necessarily changing values and expectations, make status acquisition difficult. Since, in the sparsely populated regions, even ascribed status does not have high instrumentation value[16] of the kind that is necessary to implement change, and the chances of acquiring status are limited many social problems are created. Young people leave, and the older ones are discouraged and suffer from anomie.

External Aspects of Role and Status Deficits in the Sparsely Populated Regions

A particularly destructive influence on effective role performance and status acquisition in the semi-arid and arid regions has come from external forces. These have widened and deepened the deficit aspects arising from the internal forces enumerated above. These external influences are the kind that have been exploitive and not constructive for the welfare of the sparse regions.

Three specific situations will be described in this context. These are:

(1) The town-country animosity that the National Tax Equality Association has fastened upon the northern Plains region in the form of a hostility generating war upon the cooperatives.

(2) The hostility against labor which has been and is being forced upon the communities of the sparse regions in the form of threatened right-to-work laws sponsored by the campaigns of the National Right-to-Work Committee.

(3) The discord and impoverishment perpetrated upon the sparse regions by the conservative segment of the American Medical Association, in its attempt to define as socialistic any program with which it is not in accord.

The propaganda fed into the sparsely populated regions from outside, in efforts as described above, has pitted wheat farmer against rancher, agricultural people against mainstreet businessmen, laborers against farmers, and other groups against each other. This has encouraged a kind of pluralism or fragmentation that is dysfunctional for the residents. Funds collected in the sparse regions often have been used for purposes inimical to the welfare of the residents, and for blocking constructive efforts for assimilation and integration.[17]

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Without enough people to adequately support necessary services, most Plains communities have a citizenry that is deeply divided and that gives evidence of pluralistic structure, and of minority pitted against minority. Most mainstreet people have been taught to be afraid of cooperatives and to equate them with socialism. Some farmers and ranchers initiate cooperatives while others identify themselves with mainstreet anti-cooperative attitudes. Some laborers are highly organized; others are not. Some farmers support organized labor and others are strongly opposed. And all together they are merely a handful.

Under such conditions, only a few men and women walk erect; many walk defiantly, or fearfully and ashamed. Even members of the same family, husband and wife or parents and children, walk different paths, sometimes with stiff necks. In addition to role confusion, there is also lack of official intake and frequently inadequate departure. A strong group—family, community or labor union for example—knows who its members are and what their roles are. Each is ascribed a specific status. This requires prescribed intake and departure procedures.

When intake is weak anyone can be a carpenter, even a poor one, and can charge the going wage. The banker or outside businessman, already well heeled financially, can become a farmer or rancher with access to ready cash, while the regular farmers or ranchers have less ready access to cash for expansion and operation. Often mobility is so great that departure of members is scarcely noticed, even in the case of death. The significance of the role and status of people is diminished by this kind of imputed insignificance.

Role and status deficits arising from limited economic and social opportunities are compounded by additional deficits that grow out of the conflict which has been thrust upon the sparsely populated regions from outside. Following are examples of such hostility creating forces.

The National Tax Equality Association. The National Tax Equality Association, organized in 1943 with headquarters in Chicago, had as promotor a Tom McCabe who owned a string of grain elevators in the Northern Great Plains.[17] His chief target was M. W. Thatcher, general manager of the National Farmer's Union Grain Terminal Association. This cooperative is farmer owned through local cooperatives. Tom McCabe finally sold his elevators to the GTA in 1958. He died soon thereafter and NTEA has declined in stature, at least for the moment.

NTEA purveyed propaganda to create a hate program against cooperatives, pitting mainstreet people against farmers and ranchers in the Northern Plains. Again and again, in spite of congressional investigations, Internal Revenue Service rulings, court decisions and the writings of economists and other authorities on the subject of cooperatives, this propaganda prejudiced many people so severely that state legislatures[18] repeatedly threatened to penalize cooperatives.

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Often this was no more than a threat designed only to keep animosities alive and use them again to create an issue again at a future time. Cooperatives, to this day, suffer from unwarranted attacks, and behavior is not rational concerning them in many communities. Economic opportunities have been inhibited and destroyed for people, and the growth of communities has been retarded.

This heritage of conflict and town-country distrust is the legacy that Mr. McCabe and his NTEA fastened upon a cityless land, a land without adequate communication facilities to defend itself against the anti-cooperative propaganda that has been foisted upon it from outside the region by people who sought gain for themselves only. But this example does not stand alone.

The National Right-to-Work Campaign.[20] Most sparsely populated Great Plains, Mountain and Inter-mountain states have only a handful of organized laborers, and these concentrated in transportation and shipping, mining[21] and lumbering, federal employment, or federal contract work. The remainder of labor is feebly organized, if at all, and only in spots here and there. In the small towns it is common for laborers to become contractors and owners of business, i. e., plumbing, tin smithing, barbering, construction contractors. Such master craftsmen continue to be active members of the union even though they are now employers. This is an act of infiltration, and is confusing to union members as well as purchasers of services. By this, role performance is distorted and status positions are dislocated. It is damaging to a clear understanding of work roles and status levels for organized as well as unorganized labor, employers and employees, and the community at large.

Under such conditions many workers ride on the coat tails of the small organized minority and obtain some of the wage and working condition benefits that fall as crumbs from the table of the organized few, often with the consent of the shopkeeper employers. There is evidence that the unorganized laborers of the sparsely populated area are often angry at the organized segment, separate themselves from the latter, and are even a foe on occasion. There could be nothing more instrumental in fostering role deprivation and status dislocation as well as pluralism than such factional behavior within a group that is already a minority.

National labor legislation, specifically the Taft-Hartley amendment, has a short clause—Section 14b. It says: "Nothing in this Act shall be construed as authorizing the execution or application of agreements requiring membership in a labor organization as a condition of employment in any state or territory in which such execution or application is prohibited by state or territorial law."

As a part of a piece of major federal legislation intended to alleviate a problem of national scope, this is an unfortunate clause because it countermands that which was intended to be corrected.[22] Qualified authorities agree that the 14b amendment should be repealed.

On a national scale, there are those who hope to benefit from labor unrest, and there are those "handmaidens" who would purvey any kind of propaganda as long as there is profit in it for themselves.[23] On February 10, 1966, the day the Senate postponed action on the repeal of 14b, the chairman of the National Right-to-Work Committee announced from the nation's capital that there would be a national campaign to obtain right-to-work legislation in ten additional states, all western and sparsely populated, and one of these would be Montana.[24] Forthwith an office was established in Montana with C. T. Clark, an oil distributor of Billings, as chairman and manager of the Montana campaign. On March 13, 1966, in a news story released from Billings, Montana, Mr. Clark stated: "The movement in this state would be supported entirely by Montana people, financially and otherwise. . . . Montana is a compulsory union state and we are working only to educate. . . . if the people want to do something about it, it's up to them."[25]

In the face of the statement of the National Right-to-Work Committee, this statement by the Montana chairman represents a perversion. It illustrates how outside forces use resident population and funds to create confusion and conflict; a pattern that has become typical for this citizen region. Repeated legislative efforts in some states, and actual passage of legislation in others but rejection by popular vote, indicate the persistent and destructive nature of the propagandists in following their goals, even if these are no more than earning a livelihood.[26]

It is clear that this campaign by the National Right-to-Work Committee will contribute strikingly to the mounting hostility in the sparsely populated states. Again, the population of these states, already too small to support adequately many of the services taken for granted as belonging to an acceptable standard of living today, will be decreased in stature. The fear and suspicion generated by these campaigns make any creative adjustment to the problems of the small community almost impossible.[27] Role and status opportunities will be even more confused and diminished, so that further exodus of population will follow.

The American Medical Association Attack. The fight against prepayment and medicare programs sponsored by the conservative wing of the American Medical Association has been especially destructive to role and status models in the sparsely populated regions. Many Plains communities are so small that only a general practitioner can serve, and he can serve well only when he is backstopped by specialists from the larger centers. This requires a coordinated organization between communities of varied size. The extreme efforts of some physicians, and their hired propagandists, to define any cooperative and integrated effort as socialistic has succeeded in destroying, at least to a degree, not only this necessary coordination but also the image of the physician. Also, it has inhibited constructive organizational innovations to cope with providing adequate medical care in sparsely settled semi-arid regions.

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Furthermore, the loss of the family physician as an ideal-type model has been harmful, particularly to youth. In situations in which role models are few, emulation of the few professional people that reside in the community becomes an important role learning device, and the loss of this ideal or model is truly destructive. In addition to these losses, confusion and conflict in communities has been increased, work opportunities have been limited, various kinds of services have been withheld, towns have been kept from growing, and the joining of hands by people and communities to accomplish reasonable objectives has been frustrated.

The writers will not here document weaknesses of the health program in America, and the share of this weakness that follows from the propaganda campaign that originated with the conservative wing of the AMA. These facts are well documented by Roul Tunley in his recent book, *THE AMERICAN HEALTH SCANDAL*, by Martin L. Gross in his book, *THE DOCTORS*, and by Dr. Michael Shadid in his book *CRUSADING DOCTOR*, as well as by reviewing the content of the *Journal of the AMA* and other references.[28]

Only a few items that relate to the sparsely populated region will be noted here. For the decade of the thirties the agriculturists of the Plains suffered greatly from low income and from long neglect due to inadequate medical care. Their rehabilitation as earners was dependent upon improving their health. The Resettlement Administration, later the Farm Security Administration, advanced loan money for medical care for the farmers and ranchers and their families. Medical care agreements were made with local doctors who, for the first time in many a year, had a fairly certain income. The financing of a prepayment program for farmers and ranchers was initiated.[29] If cash for the premiums was not available from out-of-pocket sources, it was paid out of the Farm Security Loan.

Then came World War II and these plans were destroyed. Blue Cross group protection was then developed for hospitals, followed by Blue Shield plans to pay the doctors. Many private individual and group plans followed. Costs have continued to rise for health insurances.[30] But even these plans could not easily reach farmers and ranchers for lack of sponsorship and organization. One of the earliest prepayment hospital and medical care programs in the sparsely populated area was at Elk City, Oklahoma. While this program was under attack by the profession, and virtually destroyed in spite of favorable court rulings, great confusion and conflict were created on all levels.[31] Individuals and communities were separated, and even destroyed by the conflict and the attendant reprisals.

The Great Plains Agricultural Advisory Council, a multi-agency council designed to cope with the problems of people in this sparsely populated region, had as its first subcommittee one concerned with the health of people in the area. Obviously doctors needed to be included on this committee. Committee efforts to bring lay people and doctors together to discuss mutual problems in providing health

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services to people in sparsely populated areas failed, mainly because of the interferences of medical people.[32]

The destructive impact of AMA upon role and status matters will not be detailed here. This research will be left to future chroniclers. Here the effort is to record the fact that some people of the sparsely populated region of the nation made an effort to work cooperativly among themselves and with doctors to get services to people and communities. The effort was stunted by the lack of medical leadership, facilities and services. It is still thwarted by these forces.

The population of the semi-arid plains and much of the arid West is so sparse and space creates such a high cost—economic and social—that special efforts must be made to get services to people. The fact of sparsity demands that for a community a single solution must take precedence over many choices, all of them puerile and inadequate to the needs. The region cannot afford the luxury of pluralism, except at a sacrificial cost. Organized group and public ways of giving services necessarily take precedence over laissez faire and highly individualistic ways.[33] These latter may be a luxury that can be afforded only by the densely populated areas.

This intransigency of the American Medical Association, without doubt, handicaps the Medicare program instituted in July of 1966. This is especially true of the sparsely populated area where personnel and facilities are already deficient in number and quality. The initiation of Medicare standards for hospitals and nursing care homes, and the proper and required coordination of these facilities with medical practitioners, will result in closing many below standard facilities or demand a hurried and therefore, unplanned updating.[34] This is truly an example of the social cost of space.

This might not have been necessary had there been adequate up-grading in the past, with the help of the medical profession. Now it appears that many communities may lose their facilities, and their practitioners as well, unless long delayed efforts are instigated. Such efforts will require the cooperation of many doctors in the larger centers, and the extension of back-stopping or consultative services from these and from state public health departments to the practitioners and facilities in the smaller places.[35] This self-regulation by the medical practitioners obviously should not be socialistic, but merely a group practice, undergirded by an economical and efficient prepayment system. It will be interesting to learn whether these and attendant innovations can be accomplished with ease and courtesy, in view of the role deprivation and status dislocation that the profession has heaped upon itself.

It appears then, that organized medicine, while engaging in the fetish of an extremely individualistic practice of medicine and mounting its attack from urban places, has done much to destroy the effective role performance and high status level of physicians in the sparsely populated areas; has removed the physician, in large part, as the ideal-type model of a professional person; has created destructive

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schisms between people and communities; and has destroyed some individuals, including physicians, in the process.

Exploratory Hypotheses Regarding Role and Status Situations in Sparsely Populated Regions of the United States

Where there is already sparse population, every attempt at fostering pluralism and every conflict result in the diminuation of "being social" and enhance the minority aspects of behavior. This detracts from the possibility of clear role models being developed and blurs the role taking and role making procedures. Limited economic and social opportunities, together with conflict and confusion, represent deficits—most particularly for the youth and the senior citizen.

Where there is this confusion and minority behavior, with the resultant role and status damage, the end result is a deficit of roles to pursue and status rungs to aspire to.

Following are a number of tentative hypotheses concerning role deprivation and status dislocation in the setting of a sparsely populated region. It should be emphasized that this analysis is limited to the United States in which the arid and semi-arid parts are attached to a humid area, the latter also dominantly the urbanized and highly industrial segment of the society. Humid area values and expectations, including their multitudinous alternates and the resultant pluralism, are thrust onto the sparsely populated arid and semi-arid regions, making indigenous adaptations difficult. There is thus a cross-cultural type of situation which creates confusion and conflict, and exaggerates existing inequities because it gives credance to a pluralism that cannot be afforded. This results in further intensification of role deprivation and status dislocation. For historical reasons, the values in this society are also a mixture of those on the frontier coupled with those of an area of greater density and oriented to a more urban and industrial value hierarchy.

The writers know of no other society that spans aridity, semi-aridity and humidity in which either the arid and/or semi-arid value system represents the dominent value system hierarchy by which actions and judgments are validated. There are societies that span such a range of climatic conditions and are similar to the United States, but their unique history and settlement pattern puts them into a setting of their own. These are Canada and Australia, and perhaps Argentina. There are, also, societies that span such a range of climatic conditions but also allow for great variation in the status hierarchy system for lack of nationwide communication and recruiting effectiveness (China and India for example). And there are societies or social systems that are limited to arid or semi-arid conditions entirely (Iran and Iraq for example). In such cases the value system hierarchy is self-determining and oriented to the local sparsity conditions.

The several hypotheses enumerated below are not intended to apply to the latter kind of social systems; they are intended to apply only to the United States—that is, societies in which there is variation

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in population, geography, social conditions and pluralism in many social aspects, but also in which communication is projected from the humid-urban area almost completely and upon the sparsely populated region, making for value conflict. These hypotheses are presented to emphasize the significance of role deprivation and status dislocation for the semi-arid regions of such a nation, when there is a premium placed on pluralisms, making it synonymous with patriotism. Furthermore, they are presented in an effort to establish the content and the boundary of phenomena so that these significant aspects of social living can be identified and, hence, more easily measured. Hopefully this will encourage an extension of research efforts, including contrasts between densely populated and sparsely populated regions in these respects.

Hypothesis I—Since work opportunities are essential to sound role development and status establishment, the impact of the influences set out in the internal and external forces that make for work and job deficits and confusion create tensions and instability. This contributes to extensive social problems in the sparsely populated areas. Role adaptation and status realignment as factors in overcoming these social problems (mental illness and anomie in old age for example) are stunted and dwarfed by these same forces that make for role and status deficits.

Hypothesis II—The role and status of the resident innovator and/or adaptor, because of the impact of the external influences (described above), and because of the confusion and conflict within the sparse regions, is made impotent and is, therefore, rejected. The existing role confusion is further intensified by lack of individual experience and by lack of group support in creating new or adapted roles which will serve to realign the status structure.

Hypothesis III—Because of the ready acceptance of external forces that have, by custom, impinged upon the people of the region, the humid area spokesmen, when pleading for the status quo, acquire heroic and charismatic stature. Thus they not only inhibit the local innovator, but create an adoration for the status quo so that the total behavior borders on the dysfunctional and the destructive.

A corollary to this hypothesis is that many "outsiders" who enter the region as residents, function to preserve the dysfunctional role and status hierarchy, but derive their own role behavior and status level from a functional system foreign to and outside the region. Their role and status situations are not relevant and do not provide realistic models for the local people; but may be inappropriately used as models, thus deepening the role confusion and status conflict. The reason that local residents accept these foreign pseudo-models is that the role and status of these foreigners appear to be achieved, thus highly valued; whereas in fact these role and status levels are only ascribed.

Hypothesis IV—When local residents identify with the status quo champions and when there are few other role models to emulate, the local residents serve as tools for these external forces, and thereby

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run the risk of role and status conflicts and confusion for themselves in their own community and in their own mind. Unless they are particularly astute, they run the risk of role deprivation and status dislocation for themselves. The additional destructive aspect is that they also provide false role models.

Hypothesis V—Because of sparsity and the consequent social distance, communication to surmount role and status barriers that are no longer significant is difficult, and traditional minority segmentation and behavior continue to be divisive forces. Under such conditions, the role and status deficit-creating forces previously enumerated are intensified. Resultant injuries are not easily healed and constructive role and status innovation cannot take place readily.

A corollary to this is that this schism and segmentation is deepened and widened, frequently in deliberate manner, by those who would divide and conquer. This enhances the deficit context for role performance and status acquisition. For example, the facts are that modern ranching and farming, which represent a historical schism with great emotional overtones, have the same production, marketing and price-income problems and objectives. The continued schism contributes to misfortune in the regions on all levels.

Hypothesis VI—Because of the relatively small numbers in each occupational group and because of consequent lack of organization and esprit de corps as to procedure, there are few formalized and standardized intake or departure procedures, and role and status expectations and values are ill defined, sometimes unknown, or even non-existent. This necessarily is a deficit context in which role deprivation and status dislocation thrive. Any agency or group which does attempt to organize itself effectively and provide a constructive climate for probable role and status development, adaptation and redefinition is automatically defined as a threat to the existing power structure, and an additional minority group is thereby effected.

Hypothesis VII—Some individuals with capacity to recognize and, therefore, to initiate role and status adaptation by themselves do so and succeed. Others fail in role performance and in acquiring status. As individuals, they cannot command the large capital amounts that are required, or the moral support that is demanded, or the alter role that is essential or the cooperation of other people to mount an effective thrust. This kind of separativeness makes it difficult for individuals to perform and interpret a newly created role; and in addition, it is difficult for others to perceive the original problem as well as the new role. Hence the individual is left without the reinforcement that would make change a reality for himself and others. An adjustment of group and institutional dimension is required for most people and adjustments on such a scale represent the true social character of the problem in the sparsely populated regions.

Hypothesis VIII—Role innovation and status realignment, delayed too long on the group and institutional level, result in such extensive frustration that cooperation may not be an effective instrument. Conflict, hopefully of a constructive kind, may be the only re-

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maining device for producing change. In a sparsely populated area, the internal and external deficit factors enumerated earlier may even frustrate reasonably constructive conflict efforts, and revolution may be necessary, as in the case of the agricultural revolts of the Populist period and the Farm Holiday Movement. The recent civil rights demonstrations illustrate the same need for constructive conflict as the change-agent.

Hypothesis IX—Consolidation of services, when effected in a sparsely populated area, results in disenfranchising many people, especially those most remote and those least in number. This results in loss of role opportunities and status raising positions unless new channels of communication and active participation are devised for the newly consolidated arrangement. The disenfranchisement is the more destructive because it limits the number of role models and experiences in role taking and certainly limits role innovation.

Hypothesis X—Extreme division of labor and specialization have destroyed the high status given to those persons who were the generalists and who performed many facets of an operation; i.e., the persons who ably incorporated a diversity of functions in a single role. There are now few generalists, no matter what the task. The sparsely populated area cannot easily support the specialist because of distance and social cost of space limitations. Therefore, people in the sparsely populated area do without the services or demand that the generalists function at a diminished status level. This applies not alone to the professional person but to the tradesman and the laborer, with the farmer and the rancher perhaps the exception. To integrate generalist and specialist services into a coordinated inter-community organizational pattern will demand great innovation in role and status matters.

Hypothesis XI—Because traditional production and even certain associated industrial and service roles are decreasing in the sparsely populated area, resulting in further population decline to the point where community survival is threatened for many towns, the sparsely populated region must be in the vanguard for developing adaptive role and status models. Such an effort will require the application of the new economics (Keynesian for example). In view of some of the other deficit forces that operate in the region, this task will necessarily be Herculean in scope. Service, management, supervisory, educational and administrative roles, which heretofore were limited in number and were often low in status because of the puritan-economic values that prevailed, will become more numerous. This would require a drastic realignment, not only of roles but of status positions for many. Occupations formerly valued for their physical production characteristics would be devalued, relatively speaking. Self-ascribed status would necessarily give way to socially defined status positions. The old space frontier would become a frontier for new role and status functions—this time socially defined and circumscribed by group expectations.

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Hypothesis XII—Since mental illness is often a product of role and status anomie, the deficit contexts for effective role performance and status acquisition in sparsely populated regions would appear to be significant factors in the increased incidence of mental illness; and instrumentation for rehabilitation through effective role performance and status acquisition in the sparsely populated region would appear to be a high priority task.

Hypothesis XIII—Because anomie in old age is in part, the product of inadequate departure from a work life and inappropriate intake into other constructive roles, these deficit contexts which prevail in the sparsely populated area are a special handicap in exploring new role and status possibilities for the elderly; and special emphasis is needed in view of the size of the population involved and the dislocation that would follow under a laissez faire policy.

Summary

The dynamics of many of the small communities in the sparsely populated regions, due to deficits both internal and external, is apparently so pathological that constructive change can eminate only from forces other than the community. Feelings of having been discriminated against and exploited and of being inadequate and insecure create minority behavior which is defensive and self-generating.

Resources and opportunities for communities in the sparsely populated area are limited and will continue to be so. Efforts at cooperation and constructive action have had such a low degree of success that new roles have not easily developed, or have had such a low prestige that they were not emulated.

Role-taking and role-making opportunities as well as models outside the family are limited. It appears that the family will continue as the strong primary group and will be the base for whatever new role and status structures are developed and tested—at least to start with. The family, too, will be the agency for establishing the new value system in which these adapted role performance and status acquisition functions can thrive. Then only will the community and other institutional agencies be able to assert their role and status imputing functions in an effective manner.

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1. The semi-aridity and aridity of the Great Plains and the arid West, the contrast of this with the humid Midwest and East, the relative sparsity of population, the differences in agriculture and in some forms of social organization, and the fact of the social cost of space are well documented. See Webb, W. P., *The Great Plains*, Ginn and Co., 1931, and other of Webb's writings; Kraenzel, Carl F., *The Great Plains in Transition*, Oklahoma University Press, 1955, and other of Kraenzal's writings; *Aridity and Man*, edited by Carle Hodge and Peter C. Duisberg, Desert and Arid Zone Research Committee, American Association for the Advancement of Science (also in Spanish) 1963, and other writings from this source; *The Future of the Great Plains*, House of Representative Document No. 144, 75th Congress, 1st Session, Feb. 10, 1939, and other publications by the House and the U. S. Senate; the Report of the President's Water Resources Policy Commission, *A Water Policy for the American People*, U. S. Government Printing Office, Dec., 1950, in three volumes, and similar reports by several federal agencies; certain Yearbooks of Agriculture published by the U. S. Department of Agriculture among them *Soils and Men* (1938), *Farmers in a Changing World* (1940), *Climate and Man*, (1941).

2. Kraenzel, Carl F., *The Great Plains in Transition*, *ibid.*, Chapter 17 through 20.

3. In this context, the authors use *sparsely populated area* as synonymous with *arid and semi-arid*. For the contiguous United States (the 48 continental states) it is the arid West and semi-arid Great Plains which are sparsely populated. Of the 17 Western contiguous

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states all except California and Washington had less than 37 persons per square mile in 1960, while none of the remaining states had as few as 37 persons per square mile except Maine and Arkansas.

4. Traditionally status has referred to social positions with defined rights and duties. Because statuses tend to form hierarchies, the inference of rank has become part of its meaning—a part which in recent years has at times overshadowed the original meaning of position. Status has come to refer not only to rank but also to prestige. Considering all or any of these variations of meaning, an individual's social status is a determinant of social class as well as self-esteem. To a status-conscious society change of status infers social mobility. In rural areas vertical mobility is associated with schooling, occupational change, change in size or efficiency of farm operations, or involvement in community activities. However, for the upwardly mobile, the young in particular, the only channel open is likely to be migration to the city.

5. Most rural sociologists accept the fact of a short status ladder, explained in large part by the fact that rural society has been dominated by primary group organizations. Contemporary documentation is to be found in Berelson, Bernard and Steiner, Gary A., *Human Behavior: An Inventory of Scientific Findings*, New York: Harcourt, Brace & World 1964, pp. 466-7.

6. An individual's roles and the status associated with them provide the means by which he participates in the family, the community and the broader structures of society. His roles and his status will determine how effective his participation will be. The individual's social environment also determines the repertoire of roles which are available to him and the degree to which he is capable of filling them.

Psychologists as well as sociologists agree that through role-taking in interactional situations the individual learns to define himself and society, and the social system in which the individual operates emerges from this process. This simply means that man is necessarily a social being. They also agree that some sense of security is basic to the learning and taking of roles. Without this the individual will not be able to take the risks required for healthy growth. He will not risk taking new roles and if he does, a hostile climate is apt to censure him for his new performance. Berelson, Bernard and G. A. Steiner, Human *Behavior, ibid*, report that severity of socialization (highly rigid or highly critical practices by parents) seems to make for generalized anxiety in later life. A part of role-taking is identification. If identification possibilities are limited, growth in role-taking ability will also be limited. Closely related to this is the need for valid adult models. Talcott Parsons in Erickson's *Youth: Challenge and Change*, New York, Basic Books, 1963, points out that in a rapidly changing society the older generation cannot present the young with role models carrying a "neatly structured definition of the situation." The barriers to adopting an unfamiliar role should not be underestimated. This is the kind of adventurous behavior that requires a secure psychological basis. To the insecure person, raised in a family and community characterized by mistrust and hostility, the possibility of adapting to unfamiliar roles may seem too risky.

7. See Berelson and Steiner, *ibid*, "Placement and Movement with the Class System", pp. 468-476 and "Behavioral Differences by Class and Mobility", pp. 476-490.

8. Kraenzel, *ibid*, Chapter 16.

9. See Nesmith, Dwight A., "What to do About Problem Towns", in *U. S. News*, May 7, 1962, p. 79; and Rude, Le Roy C., "Projection of Farm Numbers in Montana to 1975 and 2000" Montana Agricultural Experiment Station Bulletin No. 608, Oct. 1966.

10. Berelson and Steiner, *ibid*, Chapter 11.

11. Hearing before the Committee on public Works, United States Senate, 98th Congress, 1st Session, on *S. 1648, Public Works and Economic Development Act of 1965*, pp. 173-204.

12. Kraenzel, Carl F., "Pillars of Service for the Emerging Community of the Plains", in *Journal of Health and Human Behavior*, Summer-Fall, 1964, Vol. 5, pp. 67-74.

13. Kraenzel, Carl F., "Adaptation for Successful Living in the American Semi-arid and Arid West," in *Indian and Spanish American Adjustments to Arid and Semi-arid Environments*, edited by Knowlton, C. T., Committee on Desert and Arid Zone Research, A.A.A.S., Contribution No. 7, 1964.

14. Frontier society, in the past and even today, had many persons who arrogated roles and status levels unto themselves, without benefit of sanction by the community and society. History is written around such persons. Among them are Captain John Charles Fremont of the Bear Flag Republic era; General George A. Custer, of the Little Big Horn incident; Jim Hill, empire builder of the Great Northern Railroad; and Teddy Roosevelt, the Rough Rider and friend of Marquis de Mores, later President of the United States, the "trust buster," and the man with "the big stick."

15. Lorang, Glen, "Coming: Biggest Fight Yet Over Water", *Farm Journal*, Feb., 1966, pp. 38-40 and 70.

16. Instrumentation here means effectiveness in bringing about necessary adaptation, readjustment and reform rather than the mere maintenance of the status quo.

17. House Report No. 1675, 81st Congress, Second Session.

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18. The National Tax Equality Association had as its formal purposes for organization the following, namely: (1) to promote federal income tax equality between competing business enterprises and (2) to oppose tax exemptions for farm and other cooperatives. (Encyclopedia of Associations, Vol. I, p. 245). Actually cooperatives, when following true cooperative principles including those of paying patronage refunds, are not profit-making enterprises and have no income to tax, according to economists, lawyers and congressmen, and also according to court rulings. The patronage refunds are subject to income tax reporting by the individual patron. NTEA has stubbornly attacked this interpretation by economists, lawyers, congressmen and courts, either in the spirit of the "God complex" or as propagandists who were merely harassing the farm population in the interest of a job for good pay. There appeared to be a constant tie-up between NTEA and the Committee of American Small Business Organization (CASBO) which was incorporated as a non-profit organization in 1942. Congressmen Chet Holifield of Kentucky, in testifying for congressional hearings on lobbyist activities (Congressional Record Vol. 96 Part 2, p. 2658) stated: "It is strictly a phony front for big business. It is anti-labor and therefore supports the principle of big business which frequently is the opposite of that which is good for small business." He goes on to testify that "there are two pairs of twins. First the small business and Economic Foundation, Inc., and second the NTEA and the National Association of Business Men. The executive heads of these two organizations are in partnership as business counselors. V. Scott with NTEA and L. Shuler with NABM. It is generally agreed that the primary purpose of the NTEA is to support a propaganda attack against cooperatives." Congressman Daniel A. Reed, a New York Republican, also severely castigated NTEA on March 20, 1951, when he spoke of it as "an unscrupulous racket. . . directing its vicious propaganda against the farm cooperatives. . . the most brazen attempt yet made by any group of men to destroy a basic industry, viz. American Agriculture" (in the Congressional Record, March 1951, p. 2793). The NTEA was supported heavily by utility companies as is evidenced by the following list appearing in House Report 3137 entitled *Expenditures by Corporations to Influence Legislation*, a report to the House Select Committee on Lobbying Activities, pp. 255-492 (1950). During the years 1947-1950 the following corporations were among those who made contributions to the National Tax Equality League: American Automobile Insurance Co., Association of Casualty and Surety Companies, Carolina Power and Light, Central Power and Light, Cleveland Electric Illuminating Co., Columbia and Southern Ohio Electric Power and Light, Connecticut Light and Power Consumer Co., Delaware Power and Light, Detroit Edison Co., Indianapolis Power and Light Co., International Elevating Co., Kentucky Utilities Co., Lone Star Gas Co., Montana Power, North American Co., Northern Indiana Public Service Co., Ohio Edison Co., Pacific Gas and Electric Co., Pennsylvania Power and Light Co., Public Service Co. of Colorado, Public Service Company of Indiana, Public Service Company of New Hampshire, Public Service Electric and Gas Co., Rochester Gas and Electric Co., Socony-Vacuum Oil Co. Inc., Southwestern Gas and Electric Co., Texas Electric Service Co., Union Electric Co. of Missouri and Subsidiaries, Utah Power and Light Co., Virginia Power and Electric Co., Washington Water Power Co., Wisconsin Electric Power Co., and Wisconsin Power and Light Company.

19. See *New Republic*, August 16, 1948, p. 47, "Dakota Points the Way".

20. The National Right to Work Committee was formally incorporated in 1960 but various movements of this nature have been active since the early 1920s. At various times the American Farm Bureau, the National Association of Manufacturers, and the U. S. Chamber of Commerce have all promoted right to work legislation. The NRTWC describes its operations as follows:

> The national committee staff produces educational materials on the right-to-work issue, and maintains a speakers corps and a field organization which assists state organizations when invited to do so. (See the Right to Work Fact Sheet). The NRTWC reference manual states that it was organized to:
>
> 1. Provide assistance to local people in organizing statewide citizens movements to promote, enact and protect Right to Work Laws in all states.
> 2. Spearhead the mobilization of nation-wide support for retention of Section 14(b) of the Taft-Hartley Act.
> 3. Conduct a national education program designed to bring about better understanding of the Right to Work principle and the desirability, ultimately of Federal Right to Work protection.

Right to work support also comes from a wide assortment of right wing extremist groups among them the John Birch Society, American Enterprises Association, Industrial Leaders to Preserve American Principles of Competitive Enterprise and Constitutional Government and the Manion Forum. The Overstreet's in *The Strange Tactics of Extremism* discuss the Manion Forum. The Overstreet's attack on labor and its support of Right to Work issues. Among other things they say that "The name of the National Right to Work Committee should really be regarded as a euphemism. It reminds us, in fact, of some of the 'halo' names adopted by Communist fronts. The committee plays upon every atom of public impatience with union activities to make it seem that what is needed is the abolishment by law, of the closed shop; which is to say, the chief element in labor's bargaining strength. The committee seems to mean, by the 'right to work', the restoration of the worker to the pre-trade-union 'right' to stand alone as an isolated individual and bargain as best he can on such matters as wages, hours and working conditions." (See Overstreet, Harry and Bonaro, *Strange Tactics of Extremism*, New York, W. W. Norton, 1964, pp. 226-8.

21. This appears to be true in spite of the fact that one of the favorite union rallying and recruiting songs is about "John Hill" and his death in Utah and mining there; and in spite of the fact that Butte, Montana claims the distinction to having Miners Union Local No. 1. (See graduate thesis by Norma Smith entitled *The Rise and Fall of Butte Miners Union*, 1878-1914, Montana State University Library, 1961.)

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22. "The Legal Case against 14(b)" in *The American Federationist*, April, 1965, pp. 21-22.

23. The present federal administration promised to repeal 14(b), and made such an effort in 1965 and again in the early months of 1966. After a lengthy filibuster led by the Senator from Illinois, finding that cloture could not be enforced, the Majority Leader, Mike Mansfield of Montana, obtained a vote for temporary postponement.

24. See Bozeman Daily Chronicle, Feb. 11, 1966.

25. See Bozeman Daily Chronicle, Mar. 13, 1966.

26. Presently there are 19 of the 48 contiguous states that have right-to-work legislation. Nine of these are in the South, and none in the Midwest or the East except Iowa. The remaining nine are in the sparsely populated Great Plains and arid West. Five of them are on the eastern border of the semi-arid Great Plains (namely the two Dakotas, Nebraska, Kansas, and Texas). The remaining western sparsely populated states having such right-to-work legislation are Wyoming, Utah, Nevada and Arizona. Western states in which the voters rejected initiative petitions or constitutional amendments on right-to-work legislation include California twice, in 1944 and in 1958; Idaho in 1958; New Mexico in 1948; Oklahoma in 1964 and Washington twice in 1956 and 1958.

27. See McClosky, Herbert, in "Conservatism and Personality", *The American Political Science Review*, V. 52, pp. 27-45, (1958). McClosky found that "persons who scored as strongly conservative, . .proved to hold extremely conventional social attitudes, to be more responsive to nationalistic symbols, and to place greater emphasis upon duty, conformity, and discipline."

He also found that extreme conservatism correlated highly with low scores on intelligence, social responsibility and self confidence, and correlated with high scores on anomie, alienation, bewilderment, pessimism and guilt. He can be quoted as saying the following: "Far from being the elite or the masters of the prime movers, conservatives tend on the whole to come from the more backward and frightened elements of the population including the classes that are socially and psychologically depressed." He found that extreme conservatives scored higher in the clinical-personality variables of hostility, paranoid tendencies, contempt for weakness, need-inviolacy, rigidity, obsessive traits, and intolerance of human frailty. He concludes by saying:

"Although aggressively critical of the shortcomings of others, they are unusually defensive and armored in the protection of their own ego needs. Poorly integrated psychologically, anxious, often perceiving themselves as inadequate, and subject to excessive feelings of guilt, they seem inclined to project onto others the traits they most dislike or fear in themselves."

28. See Tunley, Roul, *The American Health Scandal*, New York: Harper and Row, 1966, and Gross Martin L., *The Doctors*, New York: Random House, Inc., 1966. Also in this connection see Shadid, Michael A. (M.D.), *Crusading Doctor*, Meador Publishing Co., Boston, 1956, Chapter 14, 22 and 24. Also, Christenson, R. M. in *Challenge and Decision: Political Issues of Our Times*, Harper and Row, 1964, pp. 170-171, has the following to say concerning this issue: "The record of the AMA is not one which promotes extravagant confidence. . .the AMA has a long dismal record of labelling public proposals or practices as 'communistic or socialistic' whenever it finds them unpalatable. (They) called the Social Security tax 'a compulsory socialistic tax' in 1936. . .Social Security and unemployment compensation were definite steps 'toward either Communism or socialism', . . .The extension of Social Security benefits to cover the disabled was not only a serious threat to American medicine but another step toward 'socialization'. . .Federal aid to state health organizations for maternal and child welfare care was once branded as 'wasteful, extravagant, unproductive of results and tending to promote communism'. . .The editor of JAMA said group medical practice (now a well established institution) 'savors of communism' and was the equivalent of 'medical soviets'. . .(and) accused voluntary health insurance of being 'socialism and communism' when a distinguished committee in 1932 recommended the promotion of voluntary prepayment plans. The latter was labeled an 'incitement to revolution' by the editor of JAMA. . .In addition to calling voluntary health insurance 'socialism and communism', the AMA did 'almost everything possible to prevent its development' in the 1930's and 1940's, in the words of Dr. Howard A. Rusk, Director of Medical Services, of Massachusetts General Hospital for about 30 years. Its opposition to group medical practice finally had to be broken by an antitrust suit successfully charging a conspiracy in restraint of trade. . .The AMA also has the dubious distinction of having opposed the American Red Cross blood bank, federal aid to medical schools, public venereal disease clinics, free diagnostic clinics for tuberculosis and cancer, public school health services, and federal aid to state public health agencies." Edward L. Bernays, a pioneer in public relations efforts, was employed by the Committee On the Cost of Medical Care in 1927 to publicize its study results. In this connection he speaks of the destructive propaganda barrage delivered by Dr. Fishbein. He concludes his summary in these words: "And so medical care of the American people was set back for years, although the committee's report still serves as a guide line to what will inevitably come if the American people are to get the medical care due them." This is quoted from p. 484, *Biography of an Idea: Memoirs of Public Relations Counsel* by Edward L. Bernoys, Simon and Schuster, 1965.

29. In this connection see Roemer, Milton I. and Mott, Frederick D., *Rural Health and Medical Care*, New York: McGraw-Hill, 1948.

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30. Blue Cross, Blue Shield and other plans are employer sponsored plans. All or a large portion of an employer's workers are registered in a single program. But farmers and ranchers are self employed and so recruitment is costly. Hence farm organizations, such as Farmers Union, finally developed their own plans.

31. "AMA vs. County Doctor" *New Republic*, Vol. 24, No. 7, February 12, 1951, p. 13.

32. See Shadid, *ibid*, Chapter 22 for a detailed discussion.

33. See Tinley, *ibid*, who demonstrates this principle clearly throughout his entire book, and starts with an illustration in the very introduction. He refers to the Kaiser program as a demonstration of the success by group practice, including the strikingly lower costs involved.

34. These statements are based on current inventory and research carried on under the supervision of the senior author. The executive officers of the State Boards of Health of sparsely populated states are well aware of the implications attending the institution of Medicare.

35. See Kraenzel, Carl F., "The Pillars of Service for the Emerging Community of the Plains", *ibid*. The writer attempts to indicate the nature of the back-stopping and inter-communication that would be required.

Ecology, Economy and Society in an Agricultural Region of the Northern Great Plains

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INTRODUCTION

The North American Great Plains were settled principally by people of small-farming traditions, accustomed to humid climates, and therefore unwilling to acknowledge the environmental deficiencies of the lands west of the 100thwidth meridian. Throughout the history of Western settlement, deficiency conditions have been fought, or even ignored, in an effort to fulfill the image of a potentially verdant land which needs only the hard work of men to make it bloom. In its third and fourth generation of settlement, this part of North America has only just begun to understand its position, as its population and economy drifts toward inevitable adjustments: sparse country settlement and dense "oasis" populations; and chronic difficulty in obtaining the public services and comforts afforded by the rest of the nation.

Thus, it is clear that in the countryside there are really only two broad alternatives: much of the agricultural West can support either relatively small, well-off, sparsely-distributed populations; or relatively large populations at a level of living conspicuously below national middle-income standards. An extreme example of the former are the sparsely-settled ranching communities in areas of good pasture; of the latter, the relatively densely-populated Indian reservations in submarginal or desert areas. Most Western grain or mixed farmers fall somewhere between, and no clear resolution of their adaptive status has been achieved in many districts.

The application of the generalized ecological approach to the study of these Great Plains societies must be made in full awareness of the fact that their economies operate on the theory of continous innovation, which implies constant effort toward transformation of the natural environment into usable resources. This differs from the classic case of the tribal society, which attains a particular level of resources utilization and then maintains this in a relatively static equilibrium. Such equilibria are impossible to achieve in an agrarian economy dependent upon market fluctuations of price and cost. However, since in the West, resources are either deficient or specialized, the possibilities of innovation are frequently curtailed, and extensive

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subsidies must be granted in order to encourage needed economic adjustments. In the Canadian region studied by the writer, the cost to the Federal government of supporting a farming population at survival level in a particular district from its inception to its final dissolution, over a 40-year period, was about $250,000. No criticism of such support is necessarily implied; it is simply an example of the price of ecological maladaptation in an area that should never have been opened to farming settlement.

Since the approach used in this study is derived from modern social anthropology, particular emphasis is placed on social factors. We have been concerned with discovering the effect on social organization of systems of relationships between values, economy, and natural resources; and conversely, the utility of certain social arrangements for a more adaptive use of the environment. By "adaptive use" we mean forms of exploitation of resources which both maximize and also stabilize income. Thus our basic ecological concepts are rooted in our recognition of the market frame of North American agrarian economy.

This paper contains a review of our study of ecological relationships in a 7400-square mile region of the Saskatchewan section of the northern Great Plains.[1] This region, called "Jasper" after the pseudonym of its principal service-center town and railhead, was defined by analyzing social and economic relationships of its residents with each other and with neighboring areas, and marking out the boundaries of that area in which relationships were dominantly inward. The population of this area also consisted mainly of people whose ancestors had entered the region through the Jasper railhead. We were able to define the regional perimeter quite accurately with political boundaries of several Rural Municipalities and Local Improvement Districts, and the resulting regional map is rectangular, with a grid of 125 complete and partial townships (see Fig. 1).

Fig. 1 suggests the basic topographical features of the region. The area is bisected on an east-west line by a range of partially-wooded hills, averaging 2000 feet higher than the plains to the north and south. The lower elevations have an annual rainfall of 9 to 12 inches; the hills and slopes, from 12 to 18 inches. These figures suggest the great annual and seasonal variability of precipitation, which, as in other semi-arid-variable regions, creates greater difficulties for agricultural adjustment, due to chronic uncertainty, than true desert conditions. In the pre-homesteading era, the entire region, save for small areas around Jasper Town, was used to raise horses and cattle; with the coming of the homesteaders, the plains were farmed, and ranching remained only on the hills and slopes.

The more abundant moisture in the hills permits water storage on the slopes, which in turn affords a ranching and mixed-farming industry based on irrigated forage production. The population supportable by this resource development is less than 10% of the present regional population, and it is not yet clear how much of the remainder can continue to make a living without more assured moisture supplies or greatly enlarged land holdings. The latter process has

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moved rapidly since World War II: about half of the farmers present at the end of the War have now sold out and left the region. Still, the rise in costs and the need for large-scale operations have been so insistent that it is doubtful, for some districts, whether more than half of the remaining, greatly enlarged units, can survive more than a decade.

An important adaptive process in the region concerns the tendency to select or develop particular microenvironments for the establishment of specialized productive modes (See Fig. 1). Purebred cattle farms are developing in a belt of sandy soils along the foot of the north slope of the hills, where land sells somewhat more cheaply than elsewhere. Purebred cattle can be raised on relatively small pasture units, intensively developed, and techniques for tame grass cultivation developed in the past generation can be used to make these "deserts" productive. On hilly areas near transportation arteries land is going out of farm or ranch production and into cattle feeding—another high-yield industry which can be developed on small land areas. In two districts, one to the north, the other to the south of the hills, a strategic development of community pastures and irrigation projects have permitted communities of mixed farmers to achieve a certain local stability, thus making better use of submarginal soils and rainfall-shelter areas deserted by homesteaders.

Such collective-use facilities afford farmers an opportunity to graze their herds during the summer, thus relieving the pressure on their very small home ranges, which can be used for winter grazing only. However, moisture variability in the region has resulted in fluctuating herd allotments for the community pastures, which works a hardship on the farmer who depends on the income from a small herd: then has to reduce this herd in dry years due to grass shortages in the community pasture. The only truly viable livestock regime in the area is the medium-to-large ranch, with good water and grass, in the hills or on the slopes. Only these enterprises have reasonable assurance of available resources; only these enterprises do not suffer seriously from income variability.

The region was settled on the basis of a rectangular grid land survey duplicating the system used in the U. S. Both leased grazing areas and homestead farms were allotted on the basis of this survey, without regard for soil, topography, or water resources, with the exception of the most rugged areas of the hills, which were never opened to homesteading. Over 60% of all farms homesteaded in the region were, by the 1930's, found to be in districts where the lightness of soil texture or the shortage of ground water made crops or mixed agriculture at reasonable levels of income impossible save in large units of two sections, or two square miles in extent. In Canada, as in the U.S., the homestead episode was strictly a trial-and-error experiment. Induced by political pressures before agronomic science had advanced to a point where the resource picture could be ascertained, there was nothing to do but throw the region open and see what happened. In spite of this situation, knowledge of needed modifications of the rigid tenure pattern was available, in the works of John Wesley

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Powell if no one else, and these might have been applied in such a way as to allocate farm and ranch units with greater ecological consistency. After 70 years of experiment, the most viable or stable economic units in the region are, as already noted, those ranches to be found in the resources-rugged districts in the hills, which were never opened to homesteading. This does not mean that with community pastures, fertilization, drilled wells and other developments, a viable mixed farming economy cannot be established in certain districts. It can, and is, but it is not easy, and increasing costs require increasing Government investments in resource development. The increasing land values make the great majority—about 80%—of all land sold in the region go to the relatively few existing large operators, not to the "little fellers" who need the land to survive.

The difficulties of the farmers and small ranchers of the region are thrown into high relief by the presence of six colonies of Hutterian Brethren, who moved into the region in the 1950's. These people took over precisely those farming districts with the lightest soil and the smallest and most marginal farm units. Many of these areas also had serious ground water difficulties. The colonies, however, introduced an aggressively diversified economy of large scale to these districts, as well as superior farming know-how, or at least the financial resources and equipment with which to experiment. Hutterian austerity customs also permit the diverting of relatively large sums into capital outlay, since they have few personal possessions and raise much of their own food. Nevertheless, their contribution to the local sales economy is impressive, because of their large machinery and bulk food staple purchases. In any case, these colonies are supporting about six times as many people on the submarginal land as the earlier farms, and at an average productivity about 20 times that of the farms. In spite of this relative success, the colonies are vulnerable to the same resources problems of the farms—they, too, have their low-income years. However, the good years provide them with such a substantial reserve that they are seldom in danger. Both banks and other colonies will lend them money in slow periods. In some cases, Hutterian income is even higher than farm and ranch income for certain types of per-capita figures: in particular, per-working-man income.

The region has other ethnic groups (see Fig. 1). Ranchers are all Anglo-Saxon, Canadian or U. S. born. The farmer homesteaders came from Scandinavia, Central and Eastern Europe, and the British Isles, as well as Canada and the U. S. These groups differed in the customs they brought to the region, but in no important sense have these customs remained viable in the form of local sub-cultures. The Plains were one of the most demanding environments for immigrant cultures in the New World, and one either had to "adapt or get out," in Carl Kraenzel's phrase. However, certain customs had their effect on the selective process. Ukrainian and other Eastern European groups tended to divide the family farms among the sons at the death of the first-generation father, thus creating additional substandard productive units. This led to extensive out-migration and also to a number

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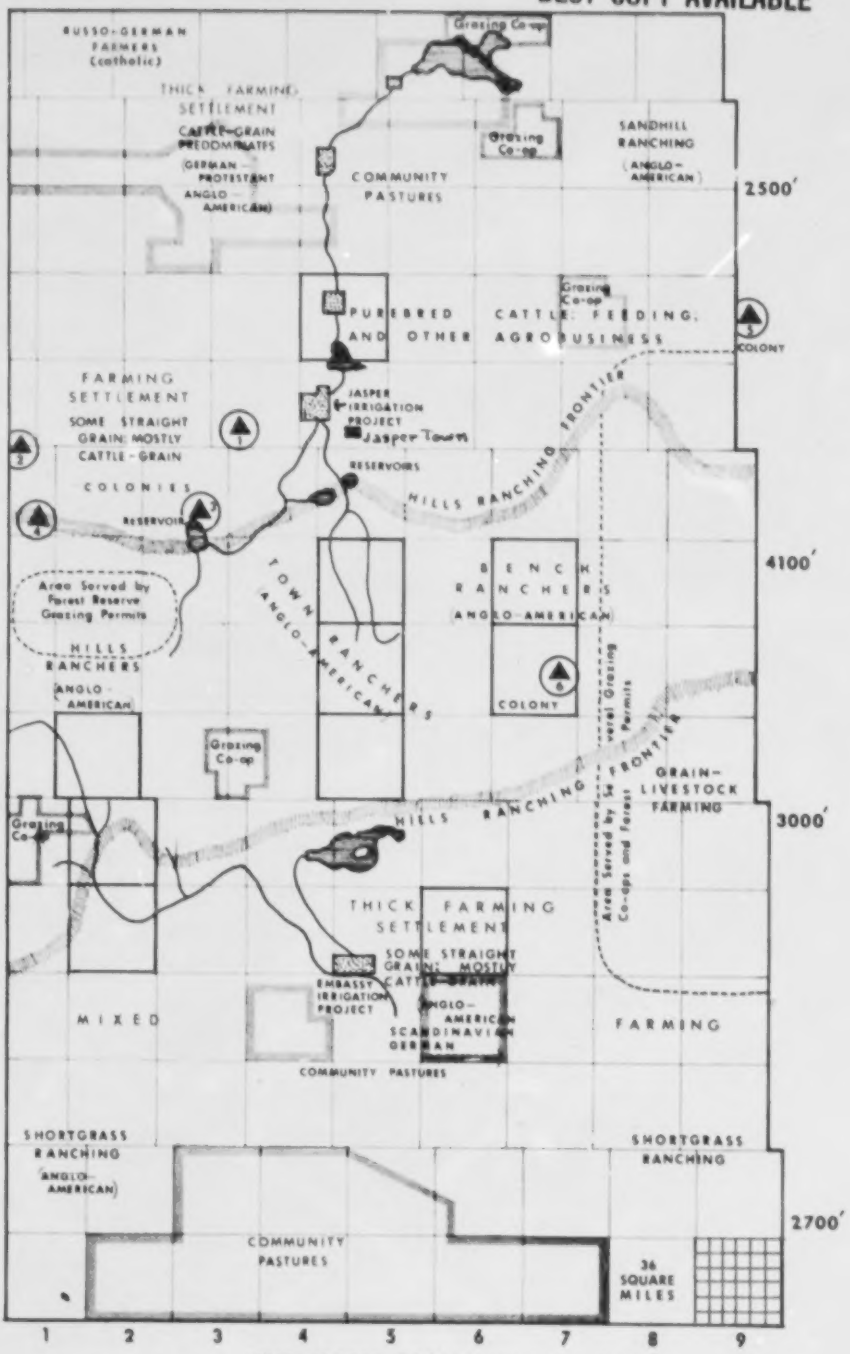

Fig. 1. THE JASPER REGION IN THE 1960's
Hutterian colonies shown by: ▲

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of marginal enterprises which the Hutterites were able to buy from their second-generation proprietors. A community of German Catholics, of Russian origin, constitutes the most important agrarian poverty class remaining in the region. Among them, backward farming traditions, plus the property-division custom noted above, have been reinforced by a conservative and clannish religious tradition. Aside from these cases, "culture" is not an especially significant factor in adaptation in this region; the requirements for successful farming are too strenuous to permit alternatives. The Hutterian Brethren are successful because their religious-cultural traditions happen to coincide with the necessary adaptive demands.

A small reservation of Amerinds completes the ethnic roster. These people exist as partial nomads in the region, supported largely by Government welfare payments, and by a variety of semi-legal and illegal business; *e. g.*, selling fenceposts to ranchers, often dipped in green dye to make them appear to be rot-proofed. These people are the region's true "landless" proletariat, and constitute a moral problem: a source of guilt for the whites, who have done little or nothing to help them.[2]

The developmental history of the Jasper region can be summarized on Fig. 2, which presents graphed data on economy, moisture, and population over the entire history of the Euro-American settlement. It may be noted that the influx of homesteaders coincided with a period of relatively good moisture, and also prices—a coincidence which occurred once previously in the U. S. during the 1870's. This coincidence of favorable factors encouraged homesteading and also the belief that the West was becoming moister. A less favorable conjunction of factors occurred in the 1930's, when both moisture and farm prices fell together—the "Dirty Thirties" as they are called in Saskatchewan. The consequent drastic decline of the homestead farming population is shown on the curve. The dollar sales curve for the Jasper General Store is a good indicator in itself of the movements of the other data, and these close relationships between cultural and natural phenomena exemplify the need for a broad ecological approach to the problems of the arid West.

Population and Ecology

Our work on population has progressed only to the point of descriptive analysis of gross numbers and their distribution; analysis of fertility and migration processes begins as this paper is written.

The accompanying Figs. 3, 4, and 5 show the population density of the region for each township at three critical time periods: 1901; 1921; 1961. The 1901 period concerns the peak of population growth under the ranching frontier; 1926 represents the peak under the homestead farming frontier; 1961 represents the remaining "adapted" population after drouths and economic depressions, and after the post-World War II economic revival. For the region as whole, the population curve would thus show a rapid rise to a peak about 1920; then a fall, increasingly steep in the 1930's; then a small rise to a low plateau in the late 1950's and early '60's.[3] This type of curve is found

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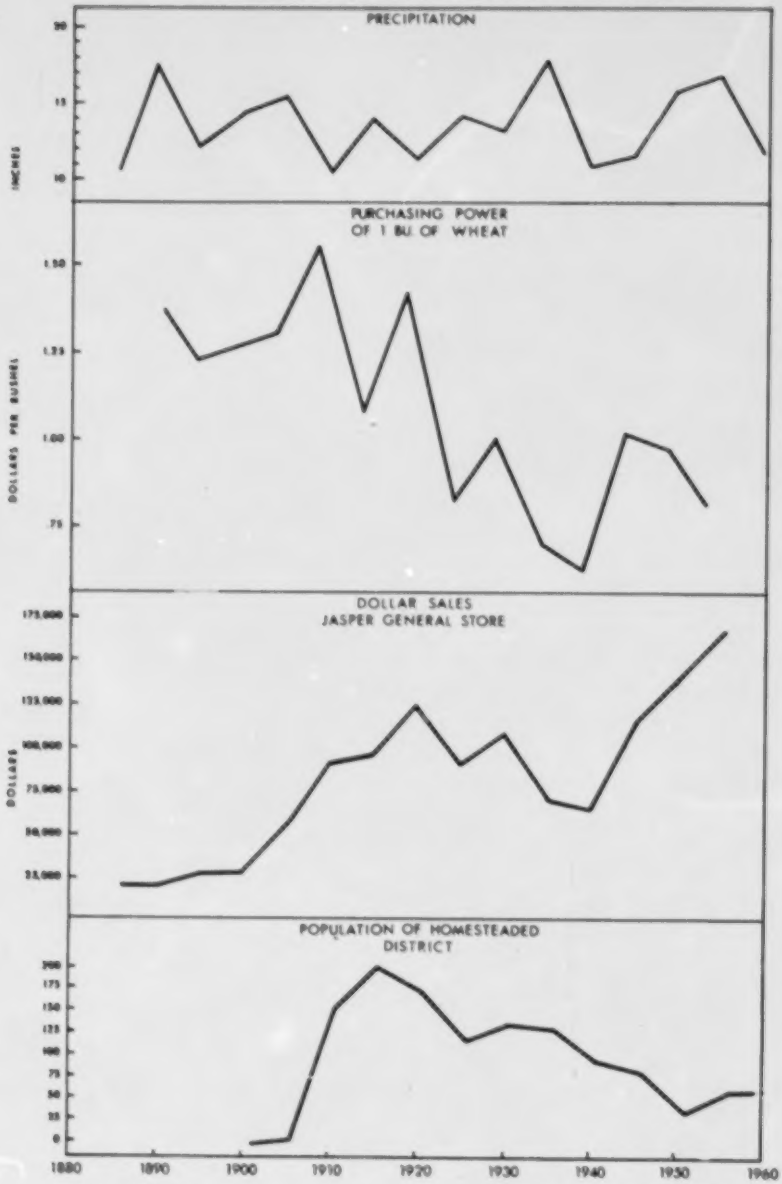
Fig. 2.

RELATIONSHIP OF CLIMATIC, ECONOMIC AND DEMOGRAPHIC FACTORS FOR JASPER REGION, 1886-1960



1886-1915

Build up of Population. Slow to 1910, rapid after.

High Precipitation and Purchasing Power in 1908-1910 period encouraged settlement.

1916-1940

Period of Fluctuating Moisture and Market. General decline in population, purchasing power, moisture, with some economic stability during war.

POST-WAR PERIOD

Period of Stable Market, Minor Moisture Fluctuation. Government Resources Projects influential.

1960's

Continued Stability. But Purchasing Power Dropping.

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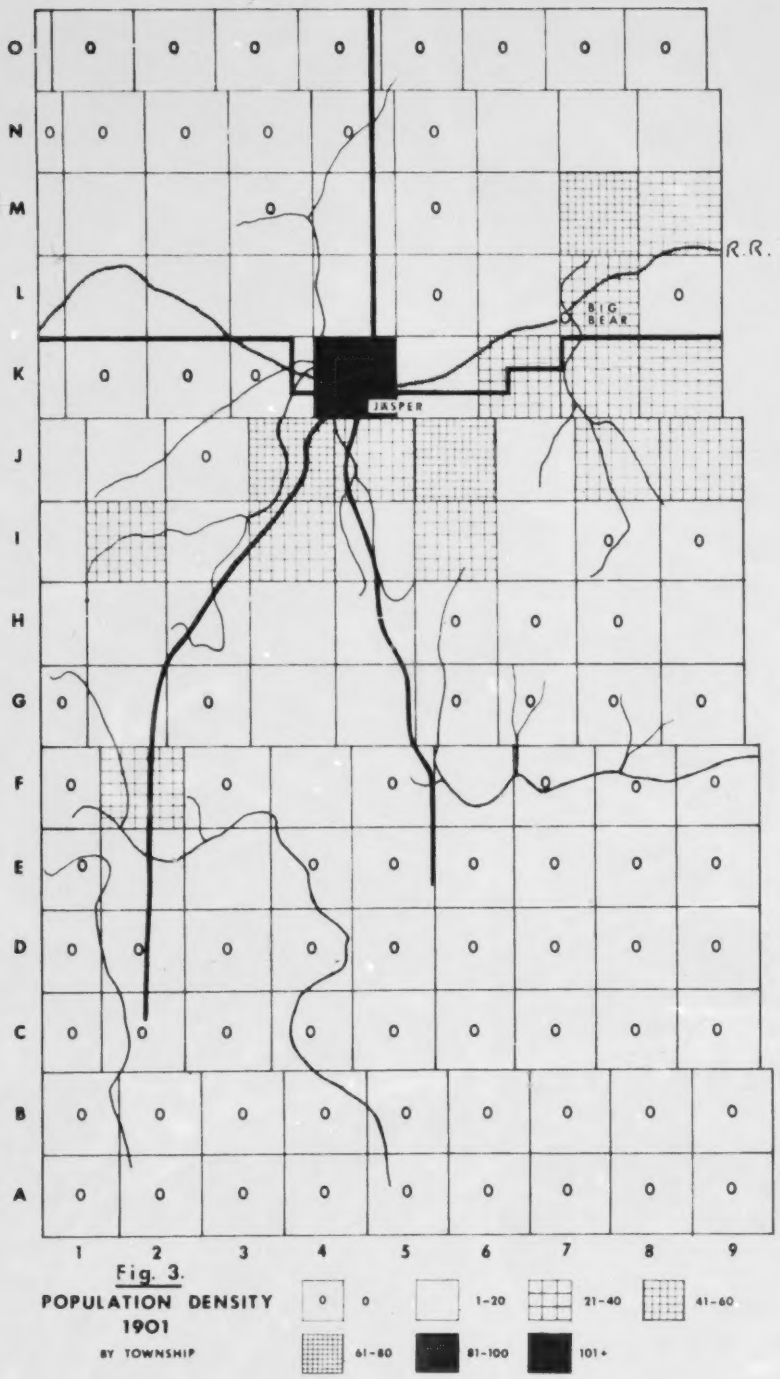

Fig. 3.
POPULATION DENSITY
1901
BY TOWNSHIP

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for nearly every region in the West which possessed a homestead farming frontier. One segment of the curve is not on these diagrams: the pre-1901. This curve would simply show a nearly flat plateau at a very low level, indicating the extremely modest population supported by the frontier ranching economy.

Inspection of these diagrams yields a picture of the history of settlement of the region. The 1901 diagram shows that the original settlement developed around Jasper town, originally a camp for the railroad workers. The availability of railroad land for sale, plus the poor roads leading toward the hills, meant that early ranching and farming settlement built up along the rail line. The population in Township rows J and I also shows the beginning of a tendency to settle along the creeks draining the hills crest; a tendency which is much more visible on Fig. 4, for 1921. It may be noted also that the roads south of the town followed the creek beds, and even by the 1960's there is no transportation artery along the east-west crest of the hills.

The demographic situation for several townships has been analyzed in order to highlight important processes. Only one of these may be described here: Township F2. This township in 1901 had a relatively dense population, despite its great distance from Jasper town. The reason for this departure from the pattern was that it occupied a small, flat plateau area suitable for farming, surrounded by rough grazing land. The flat area was the site of a number of ranch headquarters, but was also opened for homesteading. Due to this unusual combination of both types of physiographic features, this township received ranchers and a few early farmer settlers, causing the population to build up rather early for this remote location. The social life and culture of this township remains, in the 1960's, unusually intimate and localized.

By 1921 the population has built up heavily in the homesteaded townships both north and south of the belt of the hills; and has continued to do so along the railroad and near the town. A branch line has opened up on the south, and a few small towns have sprung up. Population has increased slightly in the sparsely settled hills, and in the very arid plains area at the extreme south. Township A6, on the bottom tier, had unusually heavy soil, and received more homesteaders than the others.

By 1961 population has receded from the homesteaded areas; has built up anew in certain townships due to the in-migration of Hutterian Brethren; and has remained without substantial change in the ranching townships in the hills and along the creeks. The densely-populated Township 01, in the northwest corner, contains the group of Russo-German Catholic farmers, with very large families and substandard farming units—a poverty group. Several additional villages, not shown on the 1921 diagram, would have disappeared by 1961. A group of townships in the eastern end of the hills (I, H, G, along 7, 8, 9) were homesteaded because of the deceptively productive appearance of a flat peneplane with long green grass; by 1961 this area,

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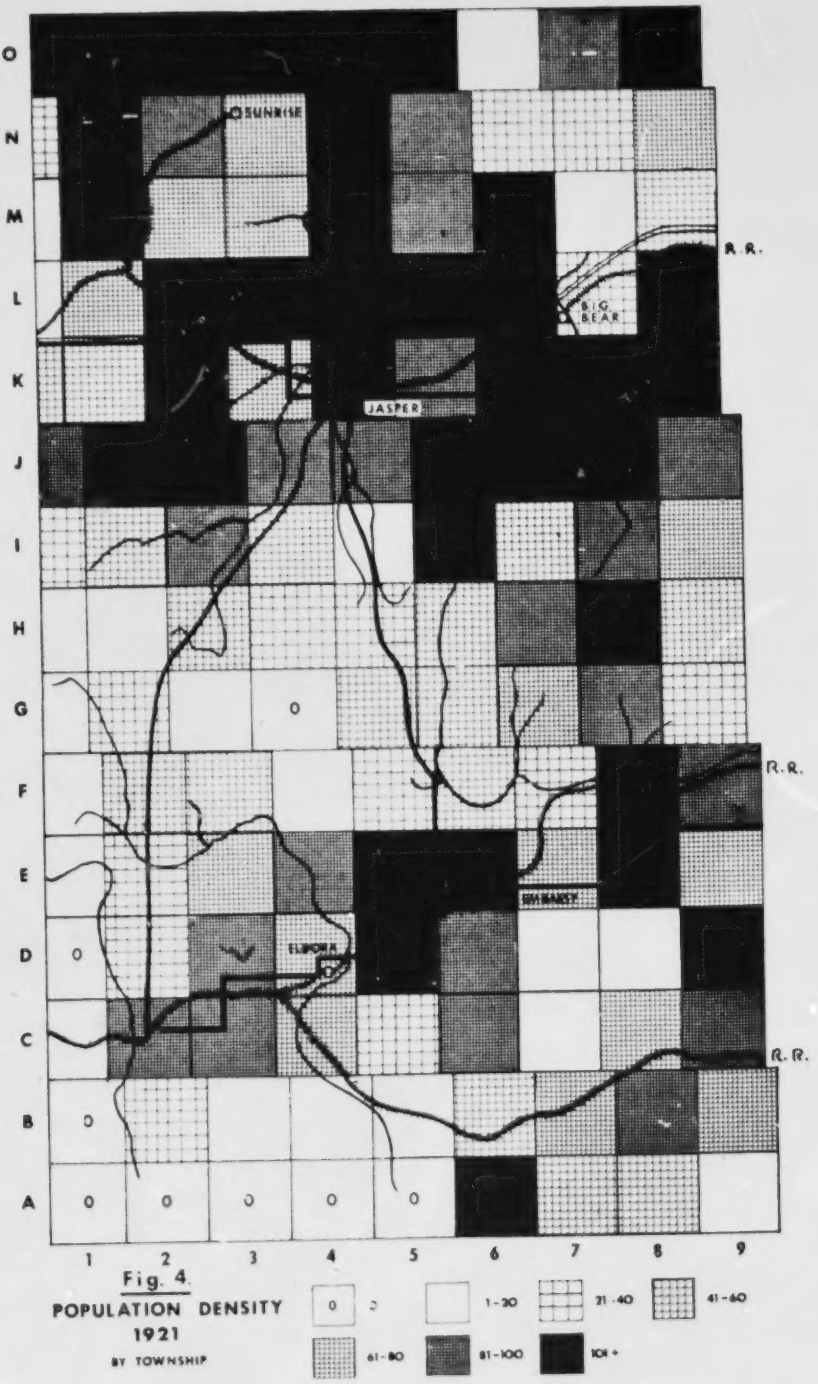

Fig. 4.
POPULATION DENSITY
1921
BY TOWNSHIP

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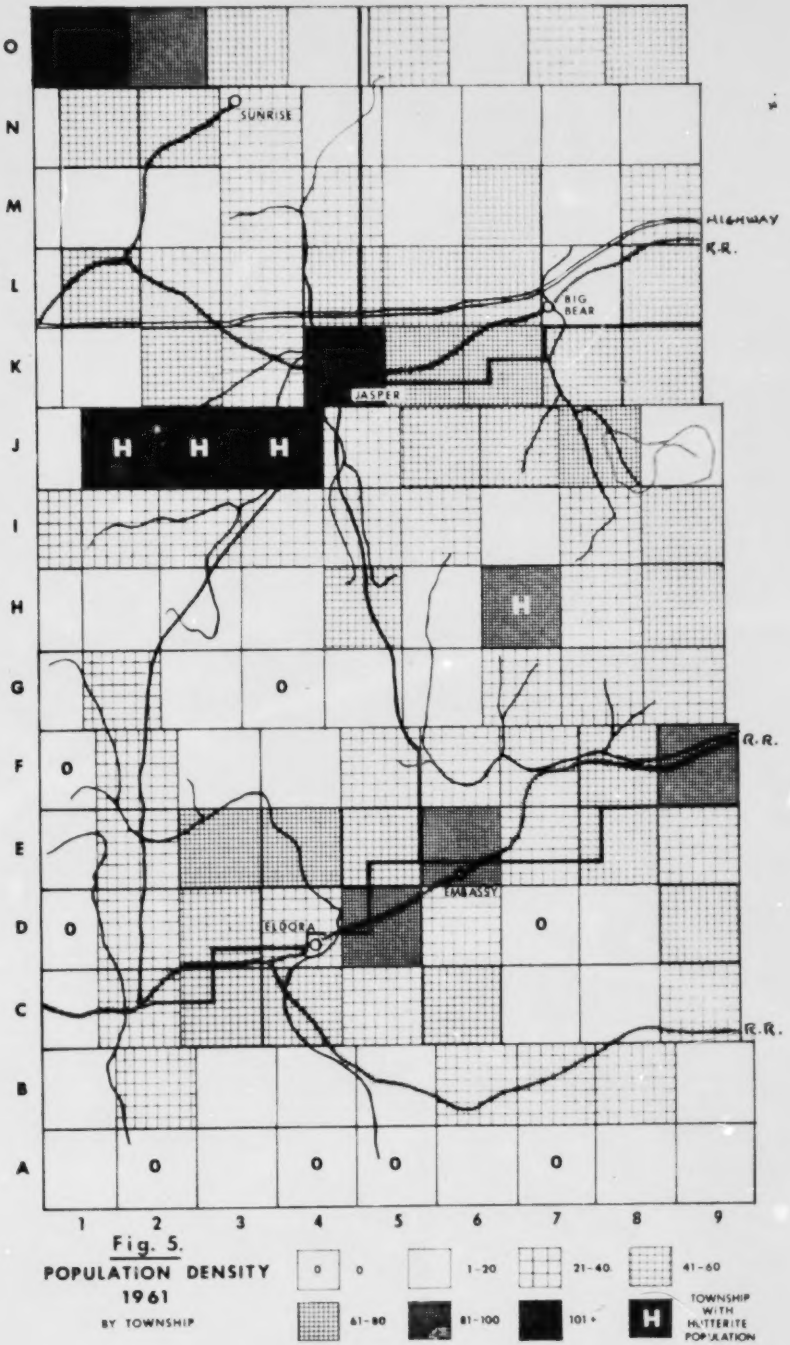

Fig. 5.

POPULATION DENSITY 1961

BY TOWNSHIP

with a mean 50-day growing season, was largely deserted by this original farming population and had reverted to relatively small-scale ranching, with a low population. The Hutterite colony in the district seized the opportunity presented by the failing population of former homestead farmers, and bought a large tract.

On Fig. 1, several community pastures, grazing co-ops, and irrigation projects are shown in two strategic loci, north and south of the hills. The pastures and irrigation projects became effective in the economy after World War II; the co-ops not until the middle or late 1950's. Studies of the population of the two principal districts served by these combined facilities indicate that there occurred a 5% "retention rate." That is, in similar townships lacking such facilities, an additional 5% of population disappeared in the 1950's. The retention in the more fortunate townships consisted mainly of married sons and their families, who decided to succeed to their fathers' enterprises. Thus the effects of resource development on the marginal farming society can be measured in demographic terms. However, the population of these districts will not increase beyond this 5% figure, since there are no additional farms available. Further selling, and expansion of existing units, will continue to a degree, and therefore the population will actually probably suffer an additional drop in years to come.

The total cost of the resources development measures in these districts was about $1 million. Since this investment has "saved" only an additional 5% increment of population (in some districts about 3 or 4 families), we have a measure of the impressive costs of economic development in these sparsely-populated areas. The low retention rate is also indicative of the rising standard of living: these people prefer to keep population and number of farms small, in order to permit a rise in the level of living. Thus they take gratifications before demographic increase.

Some preliminary studies indicate that the consistently low, flat gross-population curves of the ranching districts is due not only to sparse settlement, but also to an excess of males. These districts were settled in the 1880's by a bachelor society; women were brought in around 1900, but men have continued to outnumber women. The farming population had an approximately equal sex ratio from the beginning, since the majority of homesteaders came in as married couples, or as whole large families. The higher fertility of these farming populations contributed to the large out-migration; in other words, the settlers least able to cope with the environment and establish viable enterprises also had the largest and most fertile population.

The changes in population size and density in the homesteaded areas has meant a change in the pattern of service functions and social relationships. The disappearance of the villages has meant a dispersal of services across the towns and smaller cities: of these, only one, the town of Jasper, is in the region; the others are from 60 to 80 miles away. This has meant a development of the "Sutland" and "Yonland" pattern described for other parts of the Great Plains:

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Fig. 6

THE SOCIAL ECOLOGY OF LIVESTOCK RAISERS*

*By "Livestock raisers" we mean, primarily, the ranchers. However, as a farmer moves toward livestock, and begins to obtain about 70% or more of his income from cattle, he enters the pattern shown below. This is, on the whole, an "adapted" pattern; i.e., the mode of resources utilization provides a sustaining enterprise which in turn provides the means for stable population and a traditional culture.

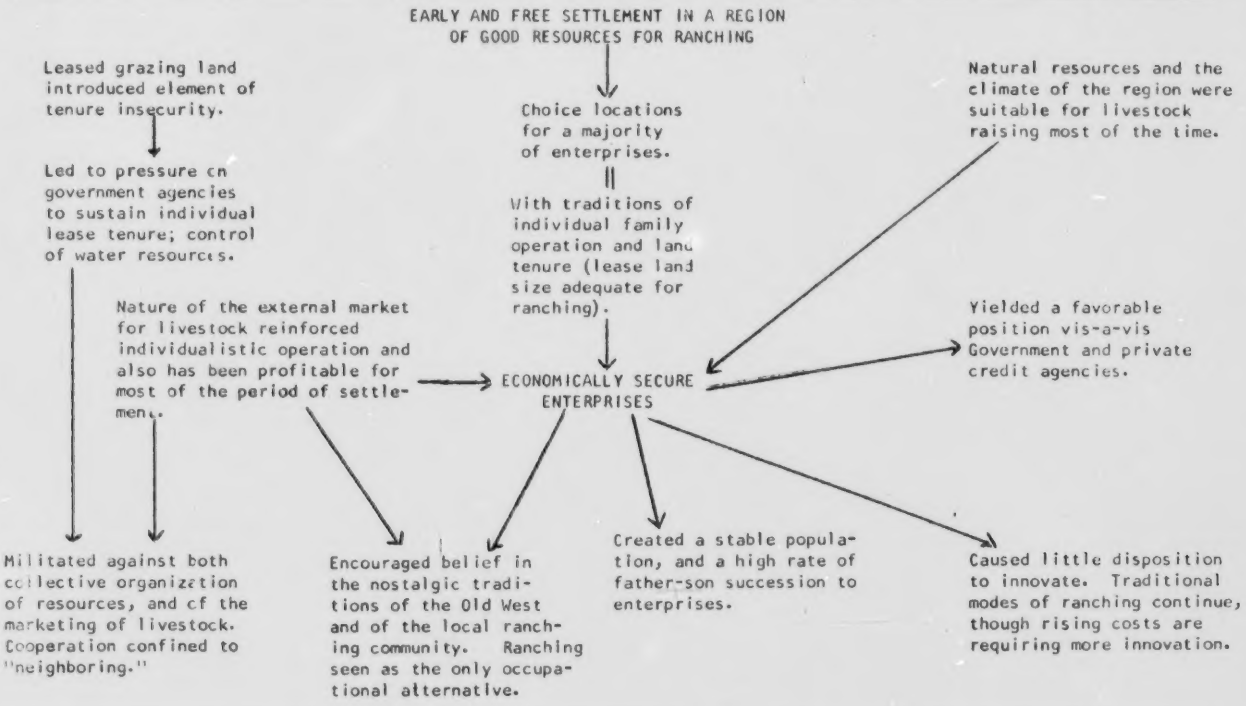
EARLY AND FREE SETTLEMENT IN A REGION OF GOOD RESOURCES FOR RANCHING
Choice locations for a majority of enterprises.
With traditions of individual family operation and land tenure (lease land size adequate for ranching).
Leased grazing land introduced element of tenure insecurity.
Led to pressure on government agencies to sustain individual lease tenure; control of water resources.
Nature of the external market for livestock reinforced individualistic operation and also has been profitable for most of the period of settlement.
Natural resources and the climate of the region were suitable for livestock raising most of the time.
Yielded a favorable position vis-a-vis Government and private credit agencies.
ECONOMICALLY SECURE ENTERPRISES
Militated against both collective organization of resources, and of the marketing of livestock. Cooperation confined to "neighboring."
Encouraged belief in the nostalgic traditions of the Old West and of the local ranching community. Ranching seen as the only occupational alternative.
Created a stable population, and a high rate of father-son succession to enterprises.
Caused little disposition to innovate. Traditional modes of ranching continue, though rising costs are requiring more innovation.

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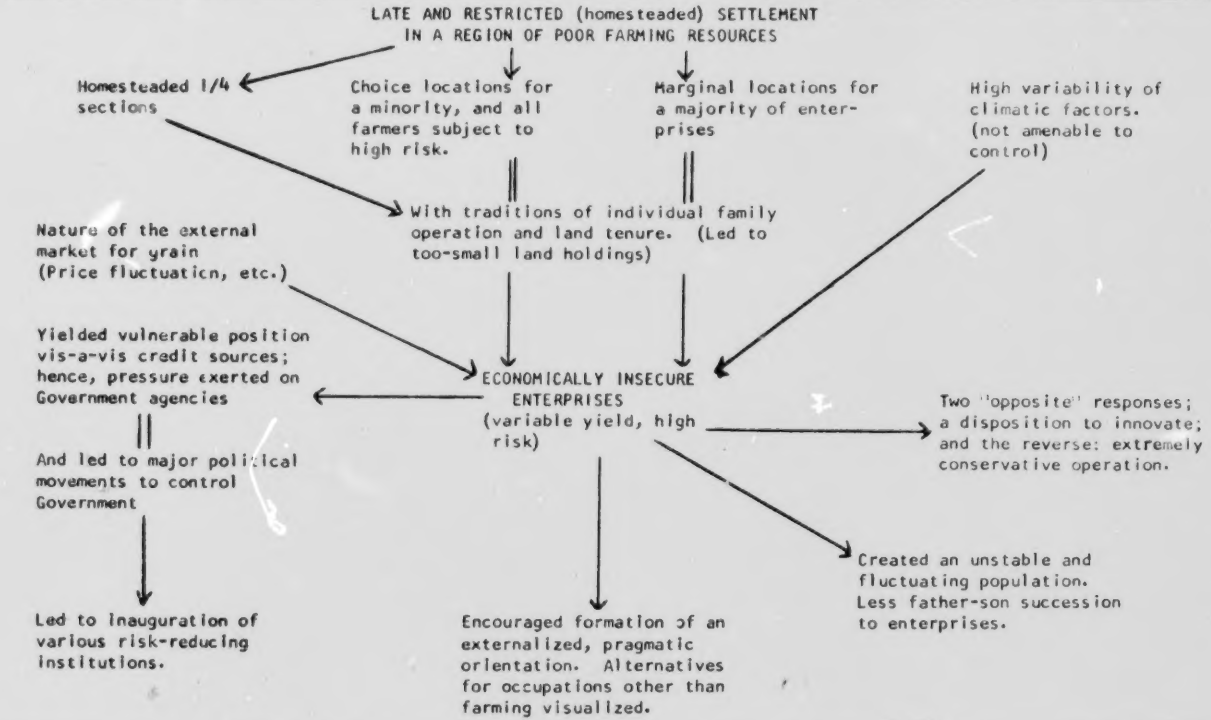
Fig. 7

THE SOCIAL ECOLOGY OF CROP RAISERS*

*By "crop raisers" we mean, primarily, the farmers, or anyone who obtains 50% or more of his income from raising crops.


LATE AND RESTRICTED (homesteaded) SETTLEMENT IN A REGION OF POOR FARMING RESOURCES
Homesteaded 1/4 sections
Choice locations for a minority, and all farmers subject to high risk.
Marginal locations for a majority of enterprises
High variability of climatic factors. (not amenable to control)
With traditions of individual family operation and land tenure. (Led to too-small land holdings)
Nature of the external market for grain (Price fluctuation, etc.)
Yielded vulnerable position vis-a-vis credit sources; hence, pressure exerted on Government agencies
And led to major political movements to control Government
ECONOMICALLY INSECURE ENTERPRISES (variable yield, high risk)
Two "opposite" responses; a disposition to innovate; and the reverse: extremely conservative operation.
Led to inauguration of various risk-reducing institutions.
Encouraged formation of an externalized, pragmatic orientation. Alternatives for occupations other than farming visualized.
Created an unstable and fluctuating population. Less father-son succession to enterprises.

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the entire Jasper region is really the "Yonland" for several "Sutland" zones to the east and west. This forces Jasperites to commute long distances for certain things they need, which in turn contributes to the further decline of the country neighborhoods. In recent years, Jasper people in many districts have embarked on conscious plans to reorganize local social life, and the response has taken the form of new riding and roping clubs, strengthened women's club activity, and the purchase of old schoolhouses and their refurbishing as community centers. There is little doubt that the sense of isolation induced by centralized schools, decreasing population and increasing travel services reached a point of no return in this friendly Western community.

The "status deficits" discussed by Carl Kraenzel have not been as important for Jasper residents, although there is some awareness of deprivation, especially among farm housewives. The pace of development has been slower in Canada, and Canadians generally do not exhibit as restless and demanding a temper as their cousins in the U. S. The condition of the roads and public facilities in the small towns, as well as social services of all kinds, is probably below the standards for comparable U. S. regions, since government supports for these things have been less abundant. The loneliest ranch now has electricity, and whether it has a telephone or not is entirely a matter of preference (some deliberately refuse). Many country-dwellers have an enthusiastic pride in their relative isolation and their relatively simple and rugged life; this is the adapted residue of the original population which enjoys a measure of privation and simplicity of life.

Economic Occupations and Social Organization

From population we may turn to some typical findings on the relationships between economy and social organization. The two principal occupational groups in the region (excluding the Hutterites) are ranchers and farmers. "Ranching" is defined as straight cattle production on relatively extensive tracts of land; "farming" is mixed grain and livestock (mostly cattle) production on relatively small and more-or-less intensively developed tracts. Although for many purposes these two groups can be regarded as having a single generalized cultural pattern, they have different historical origins, as already noted, and also differ in their social organization. The latter differences can be traced directly to the differing ecological adaptations of ranching and farming. These adaptations are summarized on Figs. 6 and 7; some comments follow.

The majority of marriages within both ranching and farming populations have been made with local—that is, Jasper region—people; Jasperites do not go far afield for their spouses. However, ranchers almost always marry ranchers; farmers marry farmers—there are few marriages across these nearly endogamous groups. Moreover, the function of kinship with respect to social solidarity differs for the two groups. In the case of the ranchers, kinship is a symbol of their communal distinctiveness; the ranchers constitute a cultural community with traditions of regional scope, which they perceive as sym-

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bolized and manifest in their kin ties. The farmers have much less *regional* solidarity; they are grouped into smaller districts, where the solidarity is based on neighborhood ties (often related to the old country school districts), and less on kinship.

Another difference is seen in the fact that the rancher sons expect to succeed to their father's enterprises, or at least obtain a ranch through kin and friendship connections if they (especially the younger sons) cannot succeed. Ranching is defined as a satisfying way of life; a respectable profession, and a more suitable way of making a living than urban occupations.[4] On the other hand, farmers' sons are often not encouraged to stay in the region—even the older sons who would be most likely to succeed. The parents do not necessarily discourage succession, but they are more inclined than ranchers to give their sons the alternative: migration and higher education. This difference appears to lie at the base of the greater rancher preoccupation with kinship continuity as a focus of community solidarity. It is related as well to ecological realities: on the whole, a ranch is a more viable and self-sustaining enterprise than a farm, and the inducements to stay and take it over, or acquire one, are more substantial.

While dependence of the son on the father after succession is found in both farming and ranching communities, there are some important trend differences. Farmers' sons, if they decide to stay, can become established sooner than ranchers' sons, for several reasons: The young farmer can take advantage of community pastures to get started in cattle; he can rent a farm on a share basis; he can farm his own half-section of land by borrowing his father's machinery (½ section is the usual amount, representing what a young man can save up to buy). None of these possibilities are open to the son of a rancher. Moreover, in the farming community the tradition of residence after marriage is neolocal; reinforced, of course, by the availability of farms)—for the rancher son, usually the only possibility is patrilocal succession, and thus he and his wife and family must live on the old place, while his father and mother are still active. The rancher son typically remains an apprentice to his father for many years; the farmer's son has a better chance of starting on his own.

These differences in social organization also contribute to differing cultural orientations in the two occupational groups. Ranchers are intensely local people; they show little, or very selective interest in the outside world, and dislike city life. They are not inclined to enter politics in the sense of campaigning for particular parties or candidates, although their political preferences are conservative. Their attempts to influence Government bureaus are carried out in the form of private persuasion and influence. Farmers, on the other hand, are less localized in their orientations, enter Provincial and national politics freely, and attempt to exert their influence in the political sphere more commonly than ranchers. These differences are also reinforced by the nature of the two economies: farming in Eastern Canada has been involved in large political movements which produced the Wheat Pool and the cooperatives, and which have

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directed the farmers' attention outward. Ranching has had no comparable movements; the rancher is content to sell his cattle at the ranch to private buyers with whom he enjoys personal and confidential relationships.

Emerging Cooperative Forms

The most significant adaptive economic change in the region has been the shift from reliance upon grain farming to a dominant livestock emphasis, and toward a "farmer-rancher" type of producer. This change is the consequence of the drought-and-depression years and the failure of crop agriculture to provide a sustaining income. The change was implemented by Government intervention in the form of already-mentioned community pastures, irrigation schemes, and cooperative grazing groups. All of these institutions were aimed at providing the farmers with the means for raising cattle, by bringing the maldistributed resources to the production unit.

Because the facilities for livestock production have been provided by government on a shared basis, the shift to this mode has required a greater measure of formal cooperation among farmers than in the past. The farming population accepted cooperative marketing of produce at an early date, but aside from the usual neighborly mutual aid, individual enterprise was the dominant frame for production. The new livestock industry among farmers requires a more cooperative approach, since the resources must be shared, and portions of privately-owned land transferred to public tenure.

Cooperation is most fully represented in the grazing cooperatives, where a group of farmers organizes as a cooperative under provincial laws, and is assigned a grazing lease, which it then operates as a cooperative ranch. All activities and decisions are carried out by the entire group, which also controls membership in the organization, vacancies being filled by vote on applicants. These organizations have been markedly successful, and the cooperating members have had little difficulty resolving their differences. Since each member also owns his own land aside from the joint lease, the sense of private property is sustained. The system represents an adaptive compromise between collective and individual farming.

The community pasture system has been less successful from the standpoint of promoting cooperative relations. The farmer patrons have no lease; are merely selected for the privilege of pasturing a fixed number of head in the pasture. While there are some collective decisions, these are minimal, and government retains all important powers. Farmers act individualistically, often competing with one another for memberships, over slight differences in the number of head allowed, and for the excess hay grown on pasture property for the bull herd. Lacking a stake in the operation, farmers merely view it as an available resource for personal gain.

Irrigation falls into similar patterns. In one project, the local renters of plots have formed a Water Users Association which, with some difficulty, controls the water and disciplines members who do

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not abide by the rules. In the other projects, Government maintains control and management because the farmers resist local responsibility, and lack the financial resources for maintaining the irrigation structures and canals. In these cases, the individual plot renters and owners compete for water, occasionally "steal" water by leaving gates open at night, complain to the government officials about the nefarious practices of neighbors, and accuse the government of playing favorites.

Since some of the grazing cooperatives and irrigation projects were established either during or shortly before the research study began, it was possible to analyze behavior of men both in and out of cooperative frames. Farmers who competed vigorously in the community pastures were able to cooperate effectively when they received a lease for a grazing co-op, suggesting that the habits of cooperation are not a matter of character or tradition so much as they are a function of the situation. Individualism and private property relations unquestionably create difficulties for production cooperation, but can work well when private property rights are retained within the system at key points.

Adaptive Selection

We have invented this term to refer to the general process of migration of population, insofar as this can be related to adaptation to habitat or economic conditions. Actually the causes of migration out of the region, or permanent residence, can be found in economic conditions, social relations, idiosyncratic factors, and geographical location. However, in this relatively specialized habitat, it can be hypothesized that factors directly related to habitat, and correlated economic conditions, will play a somewhat larger role in migration than in more generously endowed regions. The local people recognize this in their oral folklore about decisions to leave or to stay. The following quotations from interviews on the subject represent the two dominant views:

> "The ones who stayed around here were those who were too broke, or who didn't have enough brains to get out! One or the other!"
>
> "Those who stuck it out were the ones with their eye on the land, and they're doin' pretty well today!"

Our task therefore has been to separate the habitat and economy-related reasons for leaving from the others. This has not been easy for two reasons: first, people who left are not easily available for interviewing; and second, the habitat and economic reasons often underly other, more obvious personal-social reasons. It is probably impossible to make a definitive separation and provide a reliable numerical accounting of migrations due to various causes. However, some general tendencies can be isolated.

The first among these is the large portion of the first homestead farming population which left the region within a decade after homesteading in 1910, because the quarter- or half-section homestead farms were simply inadequate for economic survival. Over one-half of the

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entire first generation of farmer homesteaders left the region for this basic reason.

The second approach to the problem is to examine the existing modes of production with regard to their differential adaptability. In this sense, adaptation can be related to the fact that agriculture in this specialized region entails much higher risks than in a region with more generous resources. Given the relatively small size of the individual enterprises, and the high cost of labor, extensive diversification is difficult, and the more limited the diversification, the more vulnerable the enterprise to habitat variability and price fluctuations. The Hutterian Brethren are able to diversify successfully because of large size and abundant labor—hence are much less vulnerable than the "gentiles." Among the latter, the larger ranches enjoy the most stable incomes; the smallest farmers the least. A farmer's income is stabilized to the extent he can balance his crop with cattle. Smaller ranchers have their difficulties too—extreme drouth will force them to sell off their breeding stock.

Considering the objective situation of the several modes of enterprise, one could predict that most severe population attrition would be found for grain farmers; next, for mixed farmers and small ranchers, and large ranchers last. While our data are not completely analyzed, we have tentatively found that:

1) Straight grain farming as an *economic mode* has diminished rapidly. In one large farming district, the number of straight grain farmers has declined by 4/5ths in the 25 years preceding 1963. However, less than half of these actually left the region; most of the remainder converted to cattle-grain (mixed farming). The few remaining grain farmers have greatly expanded their land holdings.

2) Mixed farming is relatively more viable than grain farming. Hence departures of mixed farmers from the region will be influenced importantly by factors other than the hazards of single-cropping. We find this to be true: mixed farmers who "give up" have been the smaller operators; those on submarginal soils; aged men without successors on substandard enterprises; or those who dislike farming, or whose wives dislike the country. The most stable are those with membership in grazing cooperatives.

3) Ranchers on the whole—large and small—have been the most stable. The region still possesses most of the family names of the first generation of ranchers—or at least those who established ranches of quality—most of the early adventurer crew who were not really serious about ranching have of course left the region. Some of the smaller ranchers have been able to remain in the region because of paternalistic assistance given them by the larger operators. Thus, a cultural factor—pride in the continuity of the ranching traditions—has modified the process of economic attrition.

The third approach to the problem of adaptive selection is to study the enterprisers who decided to remain in the region and to cope with the high risks. Aside from a very small and fading minority of farmers and ranchers with very low levels of living and aspi-

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ration, on substandard enterprises, the families who stayed in the region through most of the crisis periods have taken advantage of the opportunities to increase their acreage. Whether they stayed because they were too broke, were too ignorant, or because they had their eye on the future, is entirely an individual matter—we find many reasons. But in any case, they *did* adapt by increasing the size of their operating units. This is most true, of course, for the farmers and smaller ranchers. The large ranches have not expanded because they are continuations of original large leases.

While enlargement of unit is adaptive in the sense that it permits increased production and spreads risks from hail, localized drouths, and the like, it does not solve all economic problems, and is not sufficient in itself to explain the persistence of many operations. In Canada, as in the U.S., ranching and farming has been moving toward a situation of "negative profits," in which returns exceed costs only if interest on investment is not computed. This is due mainly to the rapid increase in land values, brought about by the entry of agricultural properties into the speculative market. The rancher who could sell out and realize greater returns by using the proceeds for a town business, but who refuses to do so, remains in ranching because he likes it, not because he can make a lot of money. The better farms are in a similar position. Thus the decision to stay in the area is often made on cultural and personal grounds, not on financial; it is evidence of a genuine liking for the country and for the occupation of agriculture.

However, there is a fourth question. Given the fact of permanent residence in the region, and the seizing of opportunities for expansion, can we find something in common among these "stayers" with regard to their mode of operation? According to our survey of farm management and development behavior, the most common type of middle-aged farm and ranch operator—what we call the "second-generation-in-control"—is a relatively conservative, cautious individual, who avoids credit and "plays it safe" on management decisions.[5] This is also the accepted stereotype of the Jasper operator as formulated by Montana farmers to the south, and by the more aggressive farmers of other regions in Saskatchewan. Moreover, Jasperites often characterize themselves in similar terms, usually adding a favorable element:

> "People around here are awful careful with the dollar, but you won't find a better breed anywheres!"

Or in the words of a government official who had supervised the installation of irrigation projects and resettlement programs in the region,

> "In my experience, the people who stayed were the careful type, who knew how to save, and who could take some advice, who would do the things you had to do to get along here. The gambler type pulled out—he couldn't take it, and he would think he had a better chance somewhere else."

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It is not that this type of farm operator will not take risks, but that he tries to minimize risk by playing it very safe—hence his expansion is slow and modest, as compared with more aggressive operators. Moreover, he is not inclined to accept agronomic innovations—like fertilizer, cultivated grasses, or irrigation—unless there is clear proof of their immediate value. Since many of these developments which permit greater economic stability at a higher level of production are costly, and will not pay off immediately, their acceptance is delayed indefinitely among many operators.

The selective survival of a conservative type of operator should be understood as the result of two factors:[6] first, the effect of repeated climatic and economic disaster—"these people around here just never got over the Dirty Thirties"—and second, the result of a tendency for the more ambitious, and possibly more intellectually agressive individuals to leave the region as young men. The first cause must remain simply a very probable one since we have not been able to devise any method for proving it conclusively (there is much plausible and qualitative evidence in our interviews, however). The second can be researched by examining records of local secondary schools, to determine whether or not the more active or scholastically excellent students tended to leave in larger numbers. Other approaches involve the study of family histories, with the same objective, but with more qualitative measures of individual differences. While our analyses are incomplete, we can tentatively conclude that the results are positive: there is a tendency for the more ambitious and intellectually aggressive young men to leave in larger numbers than their more cautious brothers.

This tendency is reinforced by social factors. The region has, in fact, a very high proportion of father-son succession to farm and ranch enterprise—about 75% (this may be compared with a typical farming county in Iowa, which has 50%). Because of the fact that agricultural enterprise in this region has not been profitable, and that the conservative ways of the second-generation-in-control has helped to limit the accumulation of capital, the successor must usually shoulder a considerable debt upon takeover. This has been reinforced by conservative credit politices of the banks and of government. This means he must continue to work for his father or other relative, often for 10 to 15 years, before he can be financially independent. Not all sons are willing to accept this kind of "bound-dependent" role,[7] and those that *are* willing tend to be the more conservative and often less ambitious. Thus the selective survival of conservative operators is continued into another generation. From the viewpoint of the more ambitious and expansive individuals in the region, this process means that the culture and economy is oriented more toward "old folks." In the words of the young and able manager of a community pasture, who also owns his own small but intensively developed ranch,

> "There isn't nothin' wrong with this country but a tendency to think too much about the old people. They don't do enough for the young ones."

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However, there are signs of change in all these things. There is an increasing number of young men with drive and energy who lack or reject kin support, and who manage to obtain bank or government financing (somewhat liberalized in the 1960's) for a "start" on a new place. They work extremely hard, use credit boldly and imaginatively, and when they survive, their presence helps to change the prevailing conservatism. Moreover, many of the younger operators, especially those who attend agricultural college, are showing more inclination to accept agronomic innovations, and to increase their productive capacity beyond that reached by their conservative fathers. They are virtually forced to, if they wish to live at the level of "rising expectations." The smaller the farm or ranch, the more intense the development effort will have to be; the larger places can afford to "coast." Farm and ranch operators from other regions are beginning to buy property in the region, and such persons are always the more expansive type. Of course, their entry means that some of the conservative indigenous population sells out, which is one more piece of evidence for the increasing nonadaptability of the conservative operator in a time of greater prosperity and economic development. As noted earlier, this happened on a large scale in several districts when the Hutterian Brethren moved in—these progressive farmers brought out numbers of the smaller, individually-owned "holding operations." This process may be called "adaptive replacement."

Another major set of factors which influence the general process of adaptive selection are implied in the preceding paragrah. These concern the nature of management behavior as related to the particular economic and social situation of the operator. That is, the selective value, in the pre-World War II days, of the cautious operator does not mean that every farmer and rancher has been of this type. Men have always displayed differing management strategies depending upon their particular situation. In the 1960's, we have noted a tendency for the farmer or rancher with a prospective successor son to work harder in order to leave the son a better developed and/or expanded enterprise;—this is a change from the old pattern, but it is too soon to tell if the change will be general through the region. In any case, we can divide many operators into "developers" and "sitters" simply on the basis of whether or not they have a son.

Similarly, there is a difference between an operator who stresses expansion, and one who stresses development. Usually the "expander" is from outside the region, and is moving in to take advantage of available land, or he is local man who, for various reasons, finds it necessary to expand his land holdings in order to maintain his level of living, and who is willing to use credit for buying land. On the other hand the "developer" already has his "place"; he is usually older, and he works to increase production by making more intensive use of his resources: better irrigation, improved pasture, fertilizer, better cattle breeds, or more careful placement of crops by soil type.

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Such differences in management strategies are related to the particular stage and situation of the enterprise, and to some degree have always characterized the agricultural enterprises of the region.

Generalizing very broadly, one useful theory of economic change in this region is one which stresses the differing roles and views of the generations of men. Aside from all the variations due to differing adaptive positions and strategies, one may observe that the first or "builder" generation established the enterprises; the second, or "sustaining" generation expanded them and worked out reasonably efficient, though conservative, economic and agronomic methods for coping with the market and the habitat; the third and fourth, or "improving" generation is inclined to accept government aid and a more scientific and rational approach to agriculture. Thus while individualistic tendencies and private property relations persist, and attitudes toward government intervention are practical and selective, there is the feeling of a more cooperative and collective approach to the distinctive problems of living and working in the Plains. The region appears to be on the brink of major changes: the tendency of the older generation to reject massive intervention is passing, and in the next decade private and public developments in agriculture, town improvement, and tourism may be expected. These developments will certainly be hastened if a larger proportion of the more aggressive and innovative younger men will find it possible to remain in the region.

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1. "Saskatchewan Cultural Ecology Research," a project supported by the National Science Foundation, with supplemental grants by the Agricultural Development Council and Washington University. Field work began in 1961; was completed in 1965. See J. W. Bennett, Synopsis of a Cultural Ecology Research Program in Saskatchewan," PLAINS ANTHROPOLOGIST; 8-20; 1963. See also, Hutterian Brethren: THE AGRICULTURAL ECONOMY AND SOCIAL ORGANIZATION OF A COMMUNAL PEOPLE, Stanford University Press, 1967.

2. For a study of population fluctuation in the Province of Saskatchewan through the 1930's see Stella W. Alty, "The Influence of Geographic Factors on the Growth and Distribution of Population in Saskatchewan," GEOGRAPHY; 10-23; 1939. Also, Michael L. Szabo, DEMOGRAPHIC TRENDS IN SASKATCHEWAN 1921-1959, Sask. Dept. of Public Health, 1962.

3. See Niels Braroe, "Reciprocal Exploitation in an Indian-White Community," SOUTHWESTERN JOURNAL OF ANTHROPOLOGY; 21; pp. 166-178; 1965.

4. See Seena Kohl & J. W. Bennett, "Kinship, Succession, and the Migration of Young People in a Canadian Agricultural Community," INTERNATIONAL JOURNAL OF COMPARATIVE SOCIOLOGY; 6; 95-116; 1965. Also, J.W. Bennett & S. Kohl, "Two Memoranda on Social Organization and Adaptive Selection in a Northern Plains Region," PLAINS ANTHROPOLOGIST; 8-22; 1963.

5. See J. W. Bennett, "Risk and Rationality: Aspects of Behavioral Adaptation in an Arid-Variable Habitat, PLAINS ANTHROPOLOGIST; 8-21; 1963.

6. A reinforcing factor here may be found in the influence of Scottish fiscal conservatism on Canadian culture in general. See John K. Galbraith, THE SCOTCH, Boston, Houghton, Mifflin, 1964.

7. The term, "bound-dependent" has been invented to describe the particular quality of these relationships between young men and their benefactors. A culture which places great stress on individualistic competence and the necessity of the individual to "prove" himself, experiences great conflict over the necessity to remain in a state of dependency—sometimes servile dependency—for a prolonged period. The classic figure of Western fiction—the tough old father who refuses to let his son take over the farm or ranch, and make his own decisions—is a figure out of the "bound-dependent" relationship system.

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The Problem of Drought Perception

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This paper summarizes a study[1] which aims to provide a preliminary approach to the ways in which Great Plains wheat farmers perceive and cope with their main problem, the recurring hazard of drought. Data on drought perception obtained by interviewing 96 wheat farmers from six different areas in the plains portions of Nebraska, Kansas, Colorado, and Oklahoma are compared with an objective measure of meteorological drought provided by the Palmer Drought Index[2] calculated from weather records for the same six areas. Area variations in the adoption of various dryland farming practices are discussed and compared with the recommendations of local agricultural experts. Some personality characteristics of Great Plains wheat farmers are investigated by means of a modified version of Murray's Thematic Apperception Test.[3]

Major Findings

Of the hypotheses set up for testing the following appear to have been substantiated. Perception of the drought hazard varies in some degree according to (1) degree of aridity,[4] (2) amount of drought experience, and (3) personality differences. The strongest single relationship found is that perception of the drought hazard varies with aridity. As aridity increases so does the estimate of the number of drought years in one hundred, the expectation of drought next year, and the degree of agreement of the farmers' estimates with the measure of drought frequency provided by the Palmer drought index. The greater the amount of drought experience, the more accurate the perception of the drought risk. This seems to hold true except in the case of the very oldest farmers, who as a group appear less perceptive despite their greater experienc. The types of outcomes provided for TAT stories is likely to reflect broad personality differences. Study results indicate that farmers more perceptive of the drought risk are more likely to give good outcomes to achievement stories,[5] while bad outcomes and no outcomes are somewhat more likely among those less perceptive of the drought risk.

In certain stages of the adoption process face-to-face communication is considered to be of great importance.[6] Because of the sparsity of the population and thus greater distances one must travel in order to obtain such face-to-face communication, it was hypothesized that the rate of adoption for yonland areas would be lower than in sutland areas.[7] This hypothesis was neither clearly substantiated nor entirely disproved.

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Further insight into the way in which Great Plains wheat farmers perceive the problem of drought is provided by other important study findings. These are the relation of drought perception and type of operation, the tendency to underestimate drought frequency, the relationship between age and perception, and the association of certain personality characteristics with the uncertainty of weather conditions in the area.

Perception of the drought risk varies according to type of operation. Farmers who are not quite so dependent on precipitation are generally less perceptive of the drought risk. Thus farmers with a livestock emphasis perceive the risk somewhat less accurately than those whose main emphasis is wheat.

In general the farmers tend to take on optimistic stance in relation to drought frequency. Almost to a man they underestimate the frequency of meteorological drought. This is espcially true on the more humid margins and less so in the drier parts. Conversely they tend to overestimate the frequency of very good years and the yield per acre in such years. In all but the very driest counties the farmers expected many more very good years than drought years.

Age and experience are very closely related. Generally, within any one area, the older the farmer, the greater the amount of drought experience and the more experienced the group the higher the proportion of individuals more perceptive of the drought risk. But this does not seem to hold true in the case of the very oldest farmers, who, as a group, appear less perceptive despite their greater experience.

Frequently found among Great Plains wheat farmers are certain personality characteristics which appear to be associated with the uncertainty of weather conditions in the area. Group analysis of TAT stories told to cards which raised the issue of achievement showed that for Great Plains wheat farmers this is an extremely conflicted issue. The heroes in stories to the general achievement card are most commonly portrayed as in a situation in which they are being pressed to achieve but don't want to, or wanting to achieve but faced with some obstacle which makes achievement difficult. The farmers do not know how to handle the conflict and in most cases it remains unresolved. The clear parallel between the uncertainty due to the weather and the uncertain conflictful way the achievement issue is handled by the Great Plains wheat farmers suggests that at least this area of their personalities is strongly influenced by the environmental situation which they constantly face.

Some Findings Which Support Previous Research

A few of the firmer findings lend support to previous work in perception of natural hazards. Studies among flood plain dwellers and coastal residents indicate that experience and frequency of occurrence are important factors in perception of natural hazards.[8] The persons with more direct experience and those in areas more frequently effected appear to be more perceptive than those with less experience or those

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in areas where the hazards occur less frequently. These factors were found to be important in drought perception as well. The farmers with the greatest amount of drought experience and those in the more arid areas tended to be more accurate in their assessment of drought frequency, with the exception of the very oldest group.

Burton and Kates in discussing perception of natural hazards hypothesized that heightened hazard perception would be expected where the hazard is directly related to the resource use.[9] The findings of the present study offer support for this view. Wheat production, the main resource use in the Great Plains is directly affected by the drought hazard. And Great Plains wheat farmers are certainly aware of the drought hazard. In fact preoccupation with precipitation seems characteristic. In dry periods they speak of little else. They live in hope of more rain. Their perception of the present moisture conditions is accurate and they rapidly respond to even slight changes in moisture conditions. Their perception of the range of choice in land use and types of applicable practices parallels the assessment of local experts and shows that they have a relatively accurate appreciation of the differing potentialities or limitation of different areas.

Yet Great Plains wheat farmers consistently underestimate the frequency of drought years just as coastal dwellers were seen to underestimate the frequency of storm damage. In addition the wheat farmers tend to overestimate the number of very good years and the size of crop yields in such years. The fact that they tend to forget all but the most extreme droughts may help to account for such unwarranted optimism.

Some Interesting Unsolved Issues

Seeking to solve the problem of how Great Plains wheat farmers perceive the drought hazard led to consideration of a series of previously unstudied issues. Some of the questions raised are quite specific and could be tested directly. Others are more broadly speculative and less easily answered.

How do short-run changes in weather conditions affect the attitudes and actions of people in drought areas? Many separate measures suggested that the farmers respond rapidly to even slight changes in moisture conditions. In the sample of Cimarron County, Oklahoma, cited above, it was hypothesized that a series of small showers had a more marked affect on the morale of the farmers than on the soil moisture conditions. Could a rough prediction of the amount of optimism present to be made calculating the number of days since an appreciable rain?

How does the type of operation affect perception of the drought hazard? Study evidence showed that the operations more dependent on grain tended to have a higher percentage of farmers more perceptive of the drought risk.[10] Could this be extended to predict that livestock operators would be less concerned and less perceptive of the risks due to drought? This remains to be tested since all farmers in

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the present study were at least partially dependent on wheat production for their livelihood, and there were no comparable studies of farmers in the same area or other areas.

Are there certain personality traits which characterize Great Plains wheat farmers? If so, what are they? Some traits, often mentioned by other observers of the Great Plains scene were frequently found among the present study's sample of farmers. These include the theme of determination or sticking it out, the humor related to the dust and drought, and an attitude of man under nature suggesting a feeling of helplessness in the face of the environmental hazard. But whether these traits are more common here than elsewhere can not be stated with a high degree of certainty until similar studies are made of other groups, both farmers and non-farmers.

The close parallel between environmental uncertainty and the way in which Great Plains wheat farmers handle the issue of achievement leads to the larger question of the effects of the impersonal environment on the psychodynamics of the individual or groups of individuals. Would other groups with different environmental circumtances handle the issue of achievement differently?[11] Are there other facets of personality which might be similarly affected? This study's results suggest that the TAT may prove to be a useful tool for further investigations along this line.

Another question concerning the Great Plains which has broader implications is that of the relative degreee of adjustment of various areas. It was suggested that where clearly necessary for survival a larger number of adjustments are made. However, where the environmental possibilities are less clearly delineated and where it is possible to survive without making as many adjustments they are not made and the hazard is not as clearly perceived.[12] Although the role of economic efficiency was not directly examined in this study there was much evidence which indicates that in general the Great Plains wheat farmers appear to be more concerned with satisficing than with maximization of profits or developing the resource base to the optimum level. More detailed investigations might reveal the degree to which the farmers are open to niceties in adjustment to environmental variations. The wide variety of different patterns of adaptation of specific dry farming practices suggests that there are many variables interacting which are not clearly understood.

Some Implications For Public Policy

Certain of the study findings suggest guidelines for persons interested in enhancing the resource manager's awareness of the drought hazard. Since the farmers are generally aware of the drought hazard there would be no value in reemphasizing that the area is drought prone. However, it might prove helpful to point out to all farmers the frequency with which drought occurs and the effects which result including those which are less than catastrophic. The more humid areas and the less experienced farmers should benefit the most from such information.

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Because of the tendency to forget dry periods after they passed more success might attend campaigns to introduce new practices if they take place in periods of dry weather.

A certain resistance to the adoption of new practices may result from a feeling of helplessness in the face of nature, a what's the use attitude, and the fact that many see success as the ability to hold on until the rains return, rather than finding new methods to deal with drought. Because of this type of resistance public officials might achieve more success if they concentrated their efforts among some of the more innovative farmers from whom the practices could later diffuse to other members of the community.

Perception appears to be one of the important factors in the decision of Great Plains wheat farmers to adopt such practices as stubble mulch. It follows that public officials concerned with the spread of innovations or other modifications of resource use could gain insights as to procedure by investigating exactly how the resource manager perceives the hazard and the choice open to him.

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1. Thomas F. Saarinen, *Perception of the Drought Hazard on the Great Plains*, Department of Geography Research Paper No. 106, University of Chicago (Chicago: Department of Geography, 1966).

2. The mathematical derivation of the index and its rationale are to be found in Wayne C. Palmer, "Meteorological Drought," *Research Paper No. 45* U. S. Weather Bureau (Washington: U. S. Dept. of Commerce, February, 1965).

3. Henry A. Murray, *Thematic Apperception Test: Pictures and Manual* (Cambridge Harvard University Press, 1943). A group analysis of TAT stories told by Great Plains farmers utilized the Schaw-Henry techniques as outlined in Louis C. Schaw and William E. Henry, "A Method for the Comparison of Groups: A Study in Thematic Apperception," *"Genetic Psychology Monographs*, LIV (1956), pp. 247-253.

4. The degree of aridity was measured by means of the Thornthwaite Moisture Index. In this system the moisture index = $\frac{Surplus}{need} - 6\ deficiency$.

The moisture index is positive for moist climates, negative for dry climates. The values for various gradations are as follows, -40—-60 arid, -20—-40 semiarid, 0—-20 dry subhumid, 0—20 moist subhumid, 20—100 humid, over 100, perhumid. Instructions for calculating the Thornthwaite moisture index are found in C. W. Thornthwaite and J. R. Mather, "Instructions for Computing Potential Evapotranspiration and the Water Balance," *Publications in Climatology*, X, No. 3, (1957), pp. 181-311.

5. Each of the TAT cards is designed to tap a certain area of personality. Analyzed in detail for this study were stories to cards which raised the issue of achievement. This issue is very much involved in wheat farmers' perception of and adaptation to drought. For a review of research see David C. McClelland, *The Achievement Motive* (New York: Appleton-Century-Crofts, 1953), and *The Achieving Society* (Princeton, N. J.: Van Nostrand, 1961).

6. Everett M. Rogers, *Diffusion of Innovations* (New York: The Free Press of Glencoe, 1962), p. 99.

7. These terms were coined by Carl F. Kraenzel; sutland referring to the densely settled areas along transportation lines; vonland, to the more sparsely settled areas beyond. See Carl F. Kraenzel, *The Great Plains in Transition*, (Norman: University of Oklahoma Press, 1955), chapter 15. For an attempt to apply these concepts in a Great Plains setting see Courtney B. Clelland, "Sutland and Vonland in North Dakota," (*North Dakota Institute For Regional Studies Social Science Report* No. 1, Fargo: North Dakota Agricultural College, 1955).

8. Ian Burton and Robert W. Kates, "The Floodplain and the Seashore," Geographical Review, LIV, No. 3 (1964), pp. 366-385.

9. Ian Burton and Robert W. Kates, "The Perception of Natural Hazards in Resource Management," *Natural Resources Journal*, III, No. 3 (January, 1964) pp. 412-441. This issue of the Natural Resources Journal contains papers resulting from a symposium on "Perception and Natural Resources" which includes separate papers by Lucas and by Quinney in addition to the one by Burton and Kates.

10. Similar conclusions were arrived at independently by John Bennett in his current investigations in S. W. Saskatchewan, as indicated in a letter of October 5, 1965.

11. Sims using the same group interpretation technique with federal executives found a lower percentage of stories with the theme of conflict. See John H. Sims, *Psychodynamics of Two Levels of Executives in the Federal Civil Service* (unpublished Ph. D. dissertation, Committee on Human Development, University of Chicago, 1964), p. 68.

12. Similar conclusions were made by Porter in his investigations of Pokot and Wakamba adjustments to various environmental zones. See Philip W. Porter, "Environmental Potentials and Economic Opportunities—A Background for Cultural Adaptation," *American Anthropologist*, LXVII, No. 2 (1965), 409-420.

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Technological Conservatism in Cattle Ranching as an Adaptive Process

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INTRODUCTION

Studies of adaptation of cattle ranchers to their environments have been made by Bennett in Saskatchewan[1] and Strickon in Argentina.[2] This paper is based on a similar study conducted over the last two years in a part of northern New Mexico. This region is particularly suited for study of the cultural ecology of ranching because it has several physical settings and cultural groups. The present study was limited to one county in the region, San Miguel, which has topography ranging from Rocky Mountains to Southern Plains, with a large transitional zone. Two Euro-American groups are ranchers in the county, each group practicing somewhat distinct cultures which are called Anglo and Hispano for this research. Unlike the counties to the west of it, this one has no separate Indian groups, although the area was dominated by nomadic Indian hunters until well into the 19th century.[3]

The climate of the county is, except in the high mountain area in the west, semi-arid in the Koeppen-Geiger classification, Middle Latitude Steppe, Bsk. Precipitation ranges from a long-term mean of about 16 inches in the west to about 14 inches in the east, spanning a distance of about 100 miles. Elevations range from 10,000 feet in the northwest to about 4,000 feet in the extreme east. Precipitation and vegetation generally correspond to elevation, with forests of spruce and fir at the highest, woodlands of pinon and juniper mixed with grasses at the medium to about 6,000 feet, and grasslands with xerophytic plants and shrubs at the lowest elevations.

The climate has not been a constant, however, both in the folklore and observations of ranchers in more objective terms. There is general agreement, including the opinion of the state climatologist, that the climate has desiccated in the past thirty years.[4] Areas once productive croplands for dry farming now hardly support grasses. The mean annual precipitation from the beginning of records in Las Vegas in 1887, a station typical of a large part of the Plateau or middle altitude grass and woodlands, to 1946 is 17.80 inches, with wide annual variations. Drastic reduction in rainfall has been recorded since that later date, with the 1946-1960 mean annual precipitation dropping to 14.25 inches. Such a reduction has adversely affected the range lands, which earlier had been badly depleted by overgrazing[5] and by

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the plowing of much range land during the intensive homesteading period of the first two decades of this century. In the year field work for the present research was begun, 1964, there were only 8.94 inches of precipitation at Las Vegas. Other areas of the county have seen parallel variations in annual precipitation, making this dessication a major environmental factor for ranchers to consider.

Aside from some lumbering operations in the mountains and very limited irrigated crop-farming in the valleys of the Pecos and Canadian Rivers, enclosed range ranching, today mostly with cattle rather than sheep, is the chief agricultural activity in the county. An indication of this is the area of land from which commercial crops were harvested in 1959 compared to the total "land in farms" area of the county: 6,927 acres harvested from 1,988,284 acres.[7] The history of land use succession in the county is from hunting of wild ruminants, mainly bison and deer, to open range livestock grazing, to attempted dry crop-farm homesteading, then to present-day cattle grazing on fenced pastures. Except in the western river valleys all European settlement was in the 19th and 20th centuries. The county did not take part in the cattle boom of the 1870's and '80's, although surrounding parts of New Mexico did. Today sales of cattle are the major source of agricultural income, with $3,279,105 in 1959 from a total of all agricultural sales of $3,736,139, 87.7%.[8]

Extent of Technological Conservatism in Ranching

There were in 1964 121 commercial cattle ranchers in the county. Excluded from the study were two types of ranchers, those who had so few cattle that by any definition of income they could not be said to earn their livings from sales of cattle, and so-called "hobby" ranchers, wealthy absentee owners, mainly from Texas and Oklahoma, who conduct extensive operations but do not, again, depend on sales of cattle for their livelihoods. The former group are mainly ranchers having fewer than 50 mother cows, utilizing about 2,000 to 3,000 acres of grazing land. The latter group often purchase grazing land for highly inflated prices, over $40.00 per acre, running these ranches at high costs, both for capital investment and operations, usually with the intent of reducing their Federal income tax liabilities.

With exceptions to be noted shortly, the vast majority of ranchers are engaged in what might be called traditional cow-calf operations, utilizing as feed only natural, wild grasses upon fenced range, with year-round grazing, "harvesting" a crop of calves each autumn and selling these to out-of-county buyers for further feeding before slaughter for market. In a good year most such ranchers expect to obtain a calf crop of 80%, that is, there will be produced in early spring and will survive until September or October of a given year a number of calves equal to 80% of the herd of mother cows. The breed of cattle for these typical operations is commercial Hereford, with higher grade Hereford bulls used to upgrade the stock. A few heifers are kept each fall as herd replacements, and a few older cows are culled from the herd and sold with the calf crop as felt necessary. Cattle are kept on native grasses all year long, with very little use of hays

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and other feeds except in periods of heavy snow and extended droughts.

This type of operation is very similar to that common in the western high plains during the range period of the late nineteenth century, the only difference being the fencing of large tracts of privately owned land today. There is little State or Federal land available for leasing, and this land is all used on a private basis, with no attempts at cooperative or communal grazing of commercial herds. There are thus no communal roundups in fall or spring. Each rancher conducts his own roundups, utilizing unpaid or paid help of friends and neighbors when extra help is needed.

With exceptions to be noted, there is little difference in the mode of operations of ranchers in terms of ethnic identity. The main ethnic difference related to ranching is location of residence of ranchers. In this, Hispano ranchers generally live in or near riverine Hispano settlements, while Anglo ranchers usually live in more isolated locations in the midst of their land holdings. Both groups have adopted pick-up trucks as the main means of transportation upon the range, with a few horses kept for the occasional work where a truck is not useful, as in rough country or deep snow and mud conditions. Most of the ranchers' homes are modern in amenities, with electricity, running water, and indoor toilets. Few of the houses are more than neutral, modest dwellings, but they can hardly be called old-fashioned or inadequate. They are certainly among the best of rural dwellings in the county. Many ranchers own a late model car as well as one or more pick-up trucks. All this is mentioned to show that these people are not resistant to technological change in much of their lives, even though they are very conservative in the technology of ranching.

The exceptions to the general ranching pattern are entirely recent migrants to the county, all Anglo in ethnicity. The ranchers of the far eastern part of the county, the relatively low-altitude grasslands, are the most progressive among ranchers. They have not only adopted feeds other than natural grasses, but they have been willing to experiment in pasture management, soil conservation, herd improvement, and other modes of operations than cow-calf. They seem to have been far more willing than other ranchers of the county to make the capital investments such changes usually call for. Paradoxically, this eastern grassland is the poorest grazing land in the county, with a normal requirement of 60 to 70 acres of land per cow, compared to 30 to 50 acres further west at a higher altitude.

In the western half of the county some ranchers, all Anglo, have broken with the traditional pattern in a more limited sense. Several use their land not for calf production, but the summer grazing of yearling steers shipped in from Texas cow-calf operations. At least two of these western ranchers do not even own grazing lands, but lease land from private owners and graze other people's yearlings upon it. Also several Anglo ranchers have specialized in breeding purebred Hereford stock, not for eventual beef sales, but for sale to ranchers to replenish and improve beef breeding herds. One rancher has

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converted almost entirely to raising Angus cattle, selling both feeder stock and replenishment stock.

Even the largest scale Hispano ranchers, and there are several of these, continue to operate in the traditional mode. They are very scornful of those ranchers who experiment with new ways of operating, although many Hispano ranchers do cooperate with the Federal Soil Conservation Service in soil erosion control on their lands. Hispano ranchers are the second or later generation of their families to engage in ranching operations on their land. Most of these people converted from sheep to cattle ranching in the decade following the first World War, when land became available in former Public Domain through the massive failure of both Hispano and Anglo homesteaders. Many Hispano and Anglo ranchers acquired tracts as large as 30,000 acres mainly by consolidation of quarter section homesteads in the 1920's.

Technological Conservatism as Adaptive

In terms of ecology, this traditional method of ranching has been adaptive. That is to say, families have been able to obtain enough income from utilizing this steppe environment to continue living in the area at what has been considered a satisfactory standard of living. They have done this far more successfully than have other agriculturists. At the very least these people demonstrate an economic law of "Least Comparative Disadvantage." Compared to other residents of the county, cattle ranchers have a high income. A rule of thumb calculation is often used in the region of expected income of $50.00 per mother cow per year, higher or lower depending on environmental conditions such as drought. In this study ranchers were divided into three groups according to size of operations: small, with less than 100 mother cows, medium, with between 100 and 350 cows, and large, with more than 350 cows. Income roughly ranges as follows: small ranchers, $2,500 to $5,000 a year, medium ranchers, $5,000 to to $17,500, and large ranchers, over $17,500.

Compare this with actual income for 1959 from the U.S. Census of the Population,[8] and it can be seen why it is said that all ranchers are "rich," or "millionaires." The median income for all families in the county that year was $2,905. That of ranchers would be at least twice this amount, with an average cattleman having about 150 cows on the range.

In ethnic terms, Hispano median family income was $2,261 in 1960; that of Anglo inhabitants more than twice this amount or $4,810.[9] Thus an Hispano rancher with better than $5,000 average annual income is very well-off by Hispano standards and also more affluent than half the Anglo population. All ranchers are thus receiving comparatively high incomes. The incentive to try to increase cash income is weak for most ranchers. Those Hispano ranchers dwelling in or near Hispano villages have strong pressures not to display their comparative wealth among rural non-ranchers, whose median family income in 1960 was only $2,060.[10] Many rural non-farm people have only government welfare funds as income. In 1964 there were 3,390

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people from a total county population of 23,468 receiving public assistance, 14.4% of the population.[12] Many of these people live in the rural villages. Of the total male labor force of 1,770, 19.5% were unemployed in 1960. The county is an area of chronic economic depression, particularly in the rural areas. Ranchers, even the smaller ones, are high in the economic structure of the county. While traditional pressures for redistribution of wealth among members of extended families and among dependents of the village patrons have become ineffective, there are still pressures against seeking to increase income. The chief purpose of technological modifications in ranching is increasing income in at least the long run. Hispano ranchers have less incentive than their Anglo counterparts to adopt changes, increase their incomes because of their proximity to relatives and life-long acquaintances. There are other factors operating to retard adoption by these people of new practices, but closeness to a restricting social system most Hispano ranchers still feel a part of is an important one.

Maximum adoption of new practices is found among Anglo ranchers in the extreme eastern portion of the county, close to the Texas part of the Southern Plains. Least adoption, and possibly most satisfactory adaptation to the environment, is among village-dwelling Hispano ranchers. Such satisfaction, as shown, is relative to the reference group, other Hispano rural inhabitants. No Hispano ranchers, regardless of residence, were found who seriously were using or considering changes in their operations for better adaptation to a changing physical and biological environment. There was a large group of Anglo ranchers outside the eastern periphery who have modified their practices, but seldom as drastically or as enthusiastically as eastern ranchers. Not to over-state the matter, conservatism in technology is not completely a matter of ethnicity, for the flavor of all but a few Anglo ranching operations is still conservative and traditional.

So pervasive is this conservatism that the question might well be why some ranchers do adopt changes in technology rather than why the majority do not. But given the progressiveness not only of a few Anglo ranchers within the county, but also of the general progressive flavor of ranching in surrounding counties to the north, east, and south, the central problem is an explanation of conservatism in the subject county.

Already mentioned is the relative prosperity of commercial cattle growers compared to most of the population. The drive for higher income and the technical adaptation that would produce this is modified by the prevalent poverty of the western half of the county. An incentive for change is thus less strong here, especially for Hispano ranchers. But there is a whole web of other factors involved too, some ethnic, some more general.

Among the ethnic factors are these. Education—years of formal schooling—of adults is much lower for Hispanos in the county than for Anglos, 6.8 years for the former 25 years or older in 1960 compared to 11.9 years for Anglos.[13] Anglo ranchers make more use of farm and ranch journals than do their less educated Hispano counterparts.

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Lionberger has pointed out how education and obtaining information on new practices from journals enhanced adopting new practices.[11] A difference of more than five years in education level in the general population may exaggerate the ethnic difference among ranchers, but it is still a factor to be considered.

Another ethnic factor is the hostility and suspicion Hispano people, including ranchers, hold toward Anglo culture. Saunders has stressed this in Hispano conservatism toward Anglo medical technology and similar wariness has been found in this study toward Anglo innovations in ranching.[12] This is expressed most openly toward the extensive new practices of professionally-managed hobby ranches. Reinforcing ethnic prejudice here is the undisputable fact that these hobbyists have bought up, taken over many former Hispano holdings, including whole village sites and land grants. They are seen not only as Anglos, "foreigners," but usurpers. Such ethnic sensitivity extends to state and federal agricultural field workers, many of whom have tended to ignore Hispano in favor of Anglo, compounding the isolation of Hispano ranchers from information and programs of technological change. Land loss is a factor here too, with fear by many Hispano ranchers that involvement in Federal programs may mean placing their lands in jeopardy if they seek bank loans to pay their share of such programs. Many try to avoid such involvement by waiting for the government to assume total cost of such programs as soil conservation. This desire coincides with long-time dependence of Hispanos in New Mexico on government funds, as Mosk long ago noted.[13]

Other ethnic factors include lesser cash reserves for capital investment by Hispano ranchers, partly because most are smaller operators with little savings or surplus income, partly because they lack the fully commercial outlook of Anglo ranchers, seeing calves as an annual crop not unlike corn or wheat, to be grown and marketed, lived off in short-run terms. Long-range planning is difficult in a culture very much present-oriented, with little concern for soil and grass as something other than to be used for immediate needs. The common Hispano idea that man can have little control of his destiny or his physical or social environment runs completely counter to the optimistic "conquest of nature" flavor of modern Anglo technology.

Availability of bank credit is limited to these smaller operators, even should they risk seeking it. Probably ethnic prejudices against Hispano, together with badly clouded land titles and generally poorer grade livestock, make capital still less available for these people.

But concern for short-run gains, unavailability of capital is a chronic problem throughout the county and all north-central New Mexico. It explains much of the pan-ethnic conservatism of ranchers there. Also explained partly is the higher adaption of new practices on the eastern tip of the county, away from fiscally conservative Las Vegas and near capital and loan sources of more prosperous eastern New Mexico and Panhandle Texas.

One means of adapting to a dessicated environment is acquisition of more pasture. Even should capital be available to adapt in this

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manner, the price of land has gone beyond the means of commercial ranchers, who, even with their traditionally poor financial organization and records, cannot justify the cost for possible return. Expansion has been a common response of cattlemen to deterioration of their holdings. In San Miguel County such expansion is impossible except for short-term leasing of land from a neighbor who has excess land. But even leasing private land is a new practice many ranchers balk at. It is seen as important to own the land one uses.

Poor bookkeeping and related fiscal practices have been indicated as a barrier to change, with a rancher never really knowing his true income and investment, perhaps not realizing changes are needed in his operations, or perhaps not knowing what actual income he has or what funds or collateral he has to finance new practices. At the least such scant knowledge is a compounding factor in conservatism.

Ranchers are almost without exception older men, most in their fifties or older. Few have sons who are working with them to succeed them. Most are thinking in terms of retirement, with sale or leasing of the land then or after death. As Lionberger has pointed out, age is an important factor in acceptance of new practices.[7] The case fits here too. Further, most larger ranchers have made a point of or are planning to send their sons off to college to train for other occupations. Ranching is seen as hard, dirty work that requires little intelligence and ability, something to spare one's children from. Often these more prosperous ranchers stated they were in ranching because they were "too dumb" as well as too old to learn another, better trade. Smaller ranchers shared the hopes their sons would do other, "white collar" work, with the further realization that a small herd and ranch land could not be divided among all heirs and be the single source of income for any one of them.

The persistence of many Southwestern ranchers in their occupation has been described by Martin as "ranch fundamentalism" involving "those groups of people who know no other way of life and/or who romanticize the carefree independent life of the cowboy."[8] These people remain in cattle ranching in spite of opportunities to sell their lands at higher prices, submitting to what Martin calls an "opportunity cost," although none of the county's ranchers recognize such a cost, aware though they are of the constant opportunity.[9] Such a cost is not taken into account until a person no longer holds to ranch fundamentalism, at death, possibly at retirement, or, less often, at a time he decides to change his occupation.

Pessimism is the common attitude of ranchers. Most expect that eventually, given federal tax regulations, their holdings will be consolidated into large hobby operations. Most see their past successful adaptation to the environment, itself changing, as unadaptive in the future. Beef market conditions do not relieve their pessimism, for they do not see their salvation in higher American and world beef consumption. Very few are in any way trying to encourage younger men, even their own sons, to become cattlemen. A few boast of being the last bastion of free enterprise, neither wanting nor soliciting

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government aid or price support. Many feel abandoned, forgotten by their government. They are prosperous by local standards, men of some prestige and status, even with some political position. But even they see their adaptation to the environment as a failing one. Yet changes that might reverse the situation, re-establish them in a firm niche in the environment, are avoided, in good measure for reasons given here. No doubt there will always be some commercial cattle ranchers in the county, but many fewer than in the mid-20th century. The methods of the past are known to be inappropriate for the present and the future, but changes needed, even known, are not seen as possible. The very thoroughness of adherence, even loyalty, to previously adaptive practices makes future adaptation uncertain.

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